Embedded Modbus TCP Module
EMT-331Lite

User Manual

REV 1.1

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1 About the Embedded Module

1.1 General

EMT-331Lite is an embedded Modbus TCP module and provides instant Modbus TCP connectivity via the host interface which is SiboTech defined. Any device that supports the host interface can communicate with EMT-331Lite through UART.

1.2 Features

- Upgrade your UART or serial device to Modbus TCP device expediently
- Provide two kinds of operating modes

  Modbus TCP to Modbus RTU: transparent mode

  Modbus TCP to SiboTech-defined protocol: data mapping mode
- Ethernet is 10/100M adaptive
- Supports 4 Modbus TCP connects at most
- Can cache 20 Modbus TCP request messages at most in Modbus TCP to Modbus TRU mode
- Configuration software EMT-123
- Setting the IP address via the UART(Optional Features), refer to chapter 7

1.3 Specifications

- Modbus TCP to Modbus RTU mode:

  Can cache 20 request messages at most;

  When the request messages buffer overflows, it can discard the current request.
- Modbus TCP to SiboTech-defined protocol mode:

  Support function codes: 04H、03H、06H、10H

  The size of input and output buffers can be set by users:

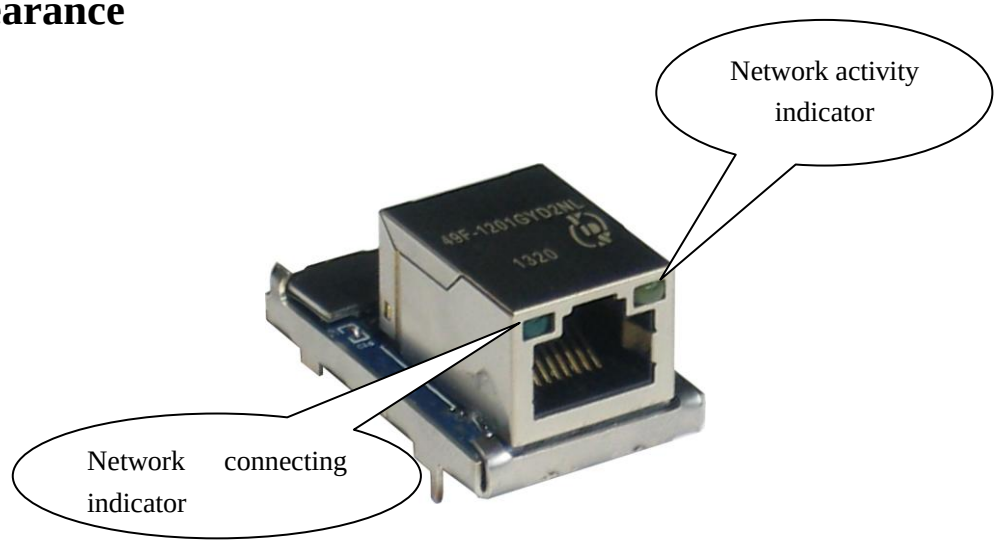
  The size of input buffer is 256 bytes at most

The size of output buffer is 256 bytes at most

- The host interface is UART, half duplex, 8 data bits, one stop bit, and no parity, and support 9600, 19200, 38400, 57600, 115200, 230400 baud rate
- Power: +3.3VDC (3.14 ~ 3.45V), 182mA
- Environmental temperature: -40 ~ 85℃, humidity: 5% ~ 90%
- Dimension: 38.3mm (Length)*23mm (Width)*21.5mm (Height)

2 Hardware

2.1 Appearance

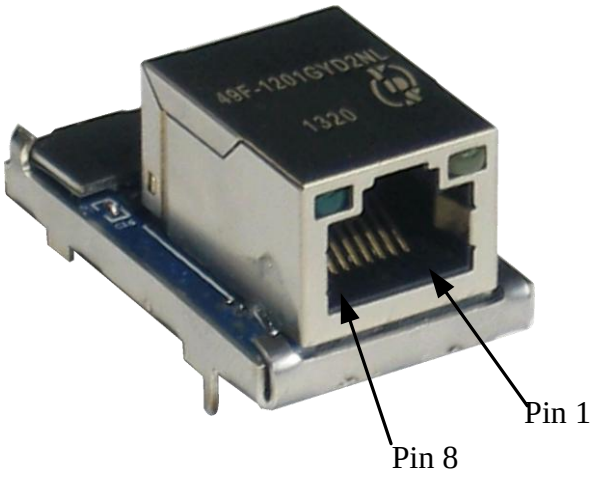


2.2 Indicators

Indicator	Status	Description
Green	Off	No network connection
	Always on	Have network connection
Yellow	Off	No network data transmitting or receiving
	Blinking	Have network data transmitting or receiving

2.3 Interface

2.3.1 Ethernet Interface

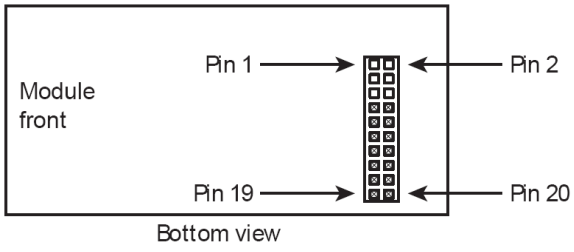


The Ethernet interface uses an 8-line RJ-45 interface，and the pin definitions are as follows:

Pins	Signals	Descriptions
Pin 1	TXD+	Transmit Data+
Pin 2	TXD-	Transmit Data-
Pin 3	RXD+	Receive Data+
Pin 4	BID+	Bi-directional Data+
Pin 5	BID-	Bi-directional Data-
Pin 6	RXD-	Receive Data-
Pin 7	BID+	Bi-directional Data+
Pin 8	BID-	Bi-directional Data-

2.3.2 Host Interface

EMT-331Lite has a 20-pin socket connector (needle-type), including power, UART and GPIO. The pin position and definition are as follows:



Pins	Signals	Description
1 ~ 6	NC	Reserved
7	RXD	UART Receive (Input), connect with TXD of host processor or MCU
8	TXD	UART Transmit (Output), connect with RXD of host processor or MCU
9	NC	Reserved
10	/RUN	The status of EMT-331Lite (Output), and need a 10K pull-up resistor on user board. Logic 1: The EMT-331Lite module is in starting. Logic 0: The module's start has been completed. If this pin is pull down to low voltage before starting the module(by using a 1K pull-down resistor), the module will start with default IP address (192.168.0.11), and this mode is used to update the firmware of EMT-331Lite.
11	BAUD2	Set the UART baud rate (Input), see the following table.
12	BAUD1	
13	BAUD0	
14	/RESET	Reset signal (Input), Active low.
15	+3.3V	+3.3V DC power Supply
16	GND	GND power Supply
17 ~ 19	NC	Reserved
20	/DATAEXCH	Data Exchange(Output), and need a 10K pull-up resistor on the user board. Logic 1: The module is in non-data exchange state (such as start state, waiting for initialization state that waits users to send messages to initialize, start the TCP protocol stack, etc.) Logic 0: The module is ready for data exchange.

2.4 UART Baud Rate

UART baud rate settings are as follows:

Index	BAUD2	BAUD1	BAUD0	Baud Rate（bps）
0	0	0	0	Reserved, don’t use
1	0	0	1	Reserved, don’t use
2	0	1	0	9600
3	0	1	1	19200
4	1	0	0	38400
5	1	0	1	57600
6	1	1	0	115200
7	1	1	1	230400

2.5 Reset Signal

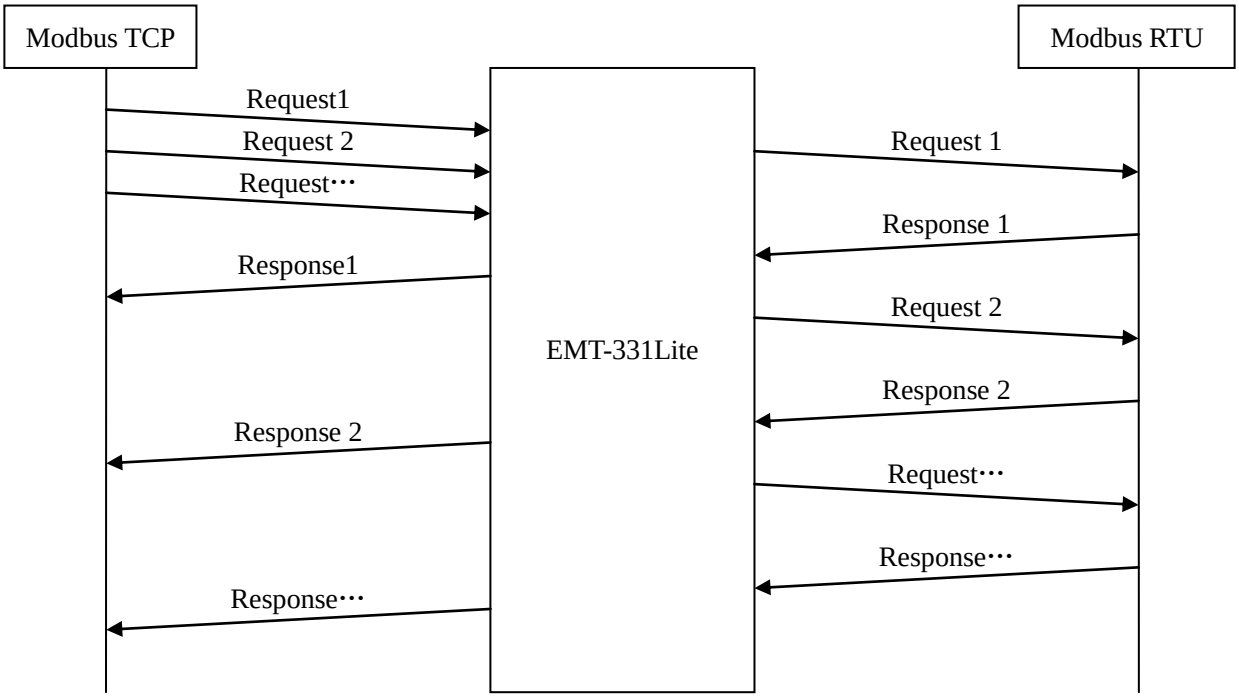
EMT-331Lite RESET (Pin 14) is hardware reset signal input. When the RESET pin is pulled down to GND or low to 2.88V lasting for 1 millisecond, the module will be forced to reset, and the host must wait for 250 milliseconds (typical value,after reset the module), and then the host must check the PIN10 (/RUN) and PIN20 （/DATAEXCH）. If the two pins are Logic 0, then the host can exchange data.

3 Modbus TCP to Modbus RTU

3.1 Description

EMT-331Lite acts as a Modbus TCP server at the Ethernet side, and a Modbus RTU master at the serial port side. EMT-331Lite receives Modbus TCP request messages come from Ethernet, then convert the message format from TCP to RTU, and send them to the serial port. RTU response messages receiving from the serial port are converted to Modbus TCP response messages and are transmitted to corresponding Modbus TCP master.

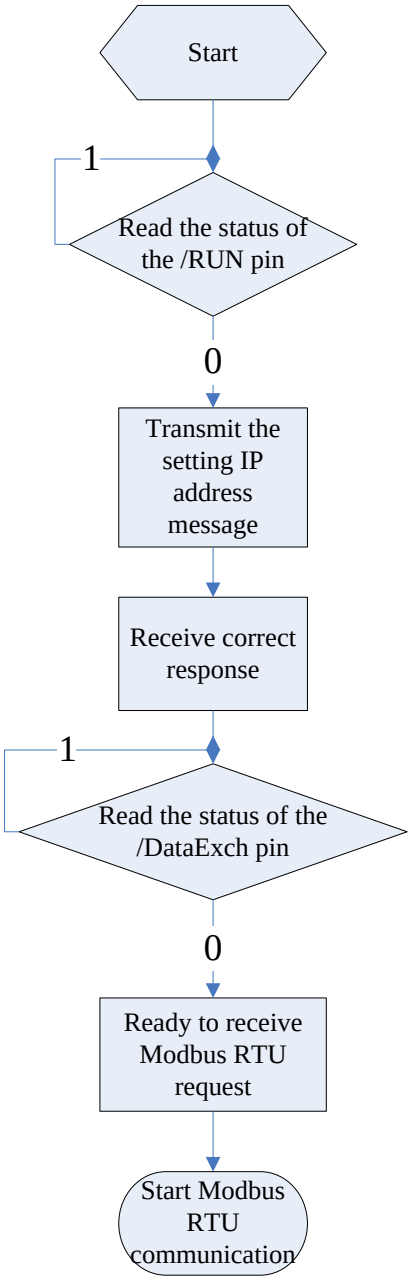
The procedure of message transmission is as follows:



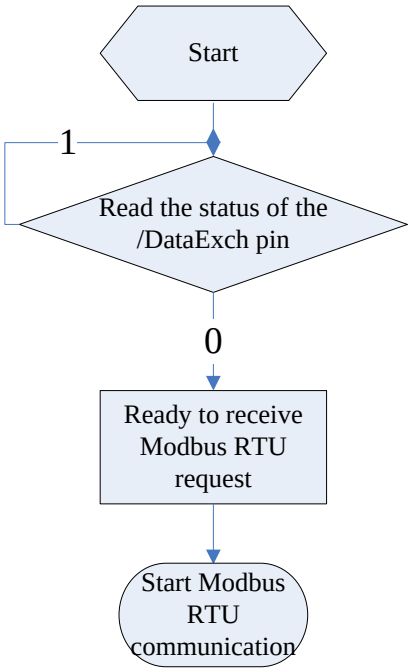
Every Modbus TCP can connect multiple requests at the same time in this mode, and all connections share the request buffer which can cache 20 frames.

3.2 The Flowchart of User Program

The flow chart of using UART setting EMT-331'IP address mode:



The flow chart of using configuration software (EMT-123) setting EMT-331'IP address mode:



3.3 Real-time monitoring IP function

If the EMT-331Lite is set to DHCP,then the module will monitor its IP when it is running.If IP changed,it will pull up /DataExch pin to logic 1.Then two cases: 1.Using configuration software setting IP address mode: The

module will obtain an IP again.User needs to read / DataExch pin state. If it re-becomes logic 0, indicating that the module has obtained IP,and the module can begin to communicate; 2.Using UART setting IP address mode: EMT-331Lite will wait the user to send the setting IP address message, and the next step is the same with the first initialization.

3.4 Transmit the Setting IP Address Message

When using UART to set the module IP address, user board (host) is the communication initiator, and EMT-331Lite responses.The module waits until it receives the setting IP address message.

EMT-331Lite reads these pins BAUD0, BAUD1 and BAUD2 that select The UART baud rate when it power on or reset.

1. Request message--- (user board->module)

Byte	Modbus TCP to Modbus RTU Mode
0	message length is 17 which includes all following bytes except the check sum byte and the length byte , high-byte first
1	
2	Reserved, always 0
3	IP Configuration Mode, 0: Static Configuration; 1: DHCP
4	IP Address, high-byte first
5	
6	
7	
8	Subnet Mask, high-byte first
9	
10	
11	
12	Default Gateway Address, high-byte first
13	
14	

15	
16	Reserved, always 0
17	Reserved, always 0
18	Reserved, always 0
19	Check sum, byte 0+byte 1+…+byte 18

2. Response message--- (module->user board)

Byte	Correct Response	Incorrect Response
0	Data length is 2	Data length is 2
1	0: Correct	Error code (not 0)
2	0	Extra error code
3	Check sum, byte 0+byte 1+byte 2	Check sum, byte 0+byte 1+byte 2

3. Error code

Index	Error Code	Explanation
0	1	Check sum error.
1	2	Data length error.
2	3	IP configuration mode does not exist.

4. Extra error code is always 0xFF.

EMT-331Lite also has sending IP address reporting function(via UART).To enable the function, you must meet the following two conditions: 1. The module is set to DHCP; 2. In the above request message table, the Byte 2 is set to 0x01; After the user transmits the setting IP address message, the user will receive "0x2E" per second, until the EMT-331Lite successfully obtain an IP address. Then the user will receive a message,and its format is shown as follows:

IP Address Report

Byte	IP Address Report
0	message length is 12 which includes all following bytes except the check sum byte and the length byte , high-byte first
1	IP Address,high-byte first
2	

3	
4	
5	Subnet Mask, high-byte first
6	
7	
8	
9	Default Gateway Address, high-byte first
10	
11	
12	
13	Check sum, byte 0+byte 1+…+byte 12

Eg:0C C0 A8 00 BB FF FF FF 00 C0 A8 00 01 95

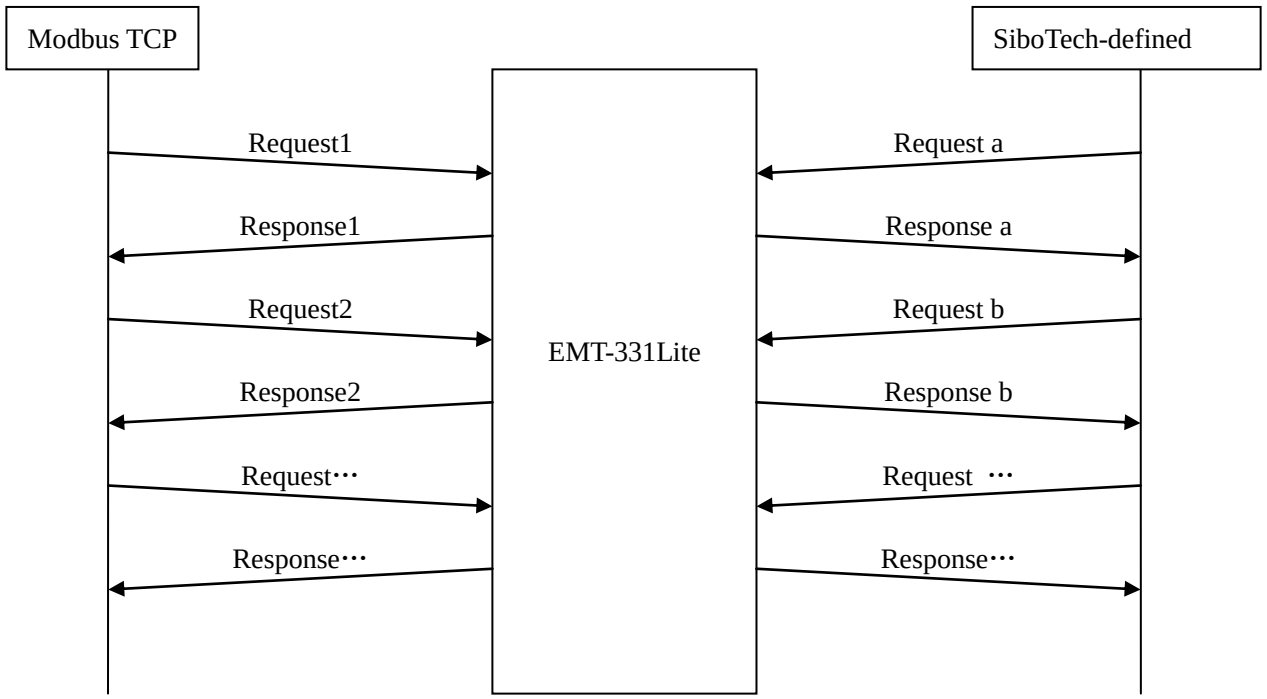
The first byte is the length. The length does not include length of checksum. The each next four bytes are IP address, subnet mask, and gateway address. Last byte is checksum.

4 Modbus TCP to SiboTech-defined Protocol

4.1 Description

EMT-331Lite acts as a Modbus TCP server at the Ethernet side, and the serial protocol is SiboTech-defined protocol. Modbus TCP communication and serial communication of EMT-331Lite are independent, and exchange data between through the input and output data buffer inside EMT-331Lite. User board can exchange data with EMT331 according to the SiboTech –defined protocol of EMT-331Lite.

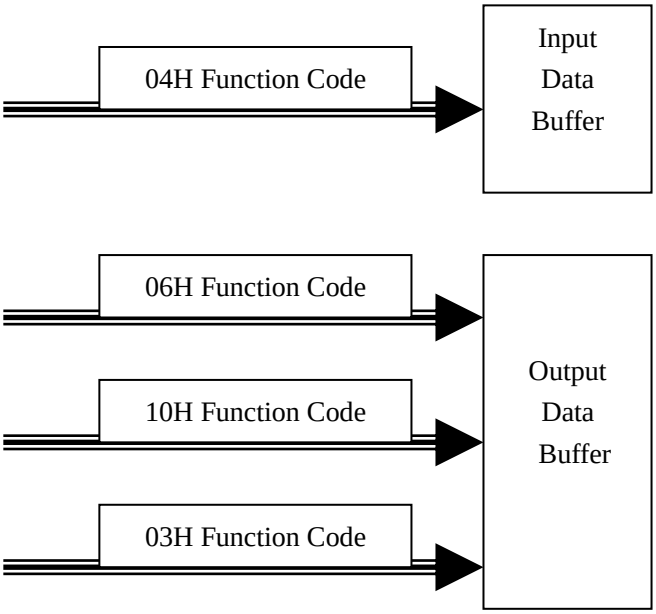
The procedure of message transmission is as follows:



In this mode, Modbus TCP only supports 03H、04H、06H、10H function codes.

Note:In this mode,each Modbus TCP client just transmits one request message,and do not transmits another request message until the Modbus TCP client receives the response or the response timeout.

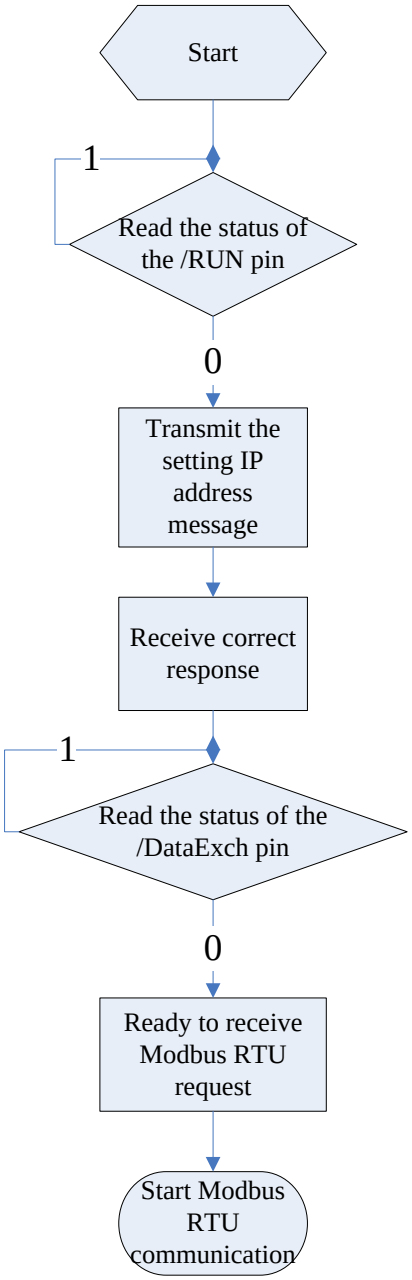
The corresponding relationship of data buffer and function codes is as follows:



04H function code is used to read input data; 06H and 10H function codes are used to write output data; 03H function code is used to read back output data, and then multiple Modbus TCP masters can exchange data using this function code.

4.2 The Flowchart of User Program

The flow chart of using UART setting EMT-331'IP address mode:



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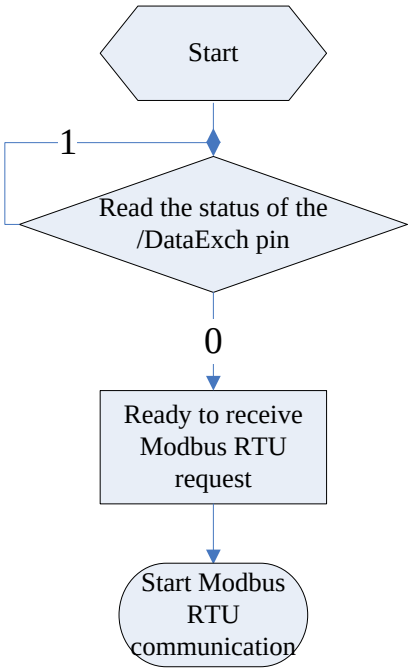

4.3 Real-time monitoring IP function

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4.4 Transmit the Setting IP Address Message

When using UART to set the module IP address, user board (host) is the communication initiator, and EMT-331Lite responses. The module waits until it receives the setting IP address message.

EMT-331Lite reads these pins BAUD0, BAUD1 and BAUD2 that select The UART baud rate when it power on or reset.

1. Request message--- (user board->module)

Byte	Modbus TCP to SiboTech-defined Protocol
0	Data length is17 which includes all following bytes except the check sum byte and the length byte, high-byte first
1	
2	Always 0, except in one case which refer to chapter 4.3
3	IP Configuration Mode, 0: Static Configuration; 1: DHCP
4	IP Address, high-byte first
5	
6	
7	
8	Subnet Mask, high-byte first
9	
10	
11	

12	Default Gateway Address, high-byte first
13	
14	
15	
16	Reserved, always 0
17	Reserved, always 0
18	Reserved, always 0
19	Check sum, byte 0+byte 1+…+byte 18

2. Response message--- (module->user board)

byte	Correct Response	Incorrect Response
0	Data length is 2	Data length is 2
1	0: Correct	Error code (not 0)
2	0	Extra error code
3	Check sum, byte 0+byte 1+byte 2	Check sum, byte 0+byte 1+byte 2

3. Error code

Index	Error Code	Explanation
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4. Extra error code is always 0xFF

EMT-331Lite also has sending IP address reporting function(via UART).To enable the function, you must meet the following two conditions: 1. The module is set to DHCP; 2. In the above request message table, the Byte 2 is set to 0x01; After the user transmits the setting IP address message, the user will receive "0x2E" per second, until the EMT-331Lite successfully obtain an IP address. Then the user will receive a message,and its format is shown as follows:

IP Address Report

Byte	IP Address Report
0	message length is 12 which includes all following bytes except the check sum byte and the length

	byte , high-byte first
1	IP Address,high-byte first
2	
3	
4	
5	Subnet Mask, high-byte first
6	
7	
8	
9	Default Gateway Address, high-byte first
10	
11	
12	
13	Check sum, byte 0+byte 1+…+byte 12

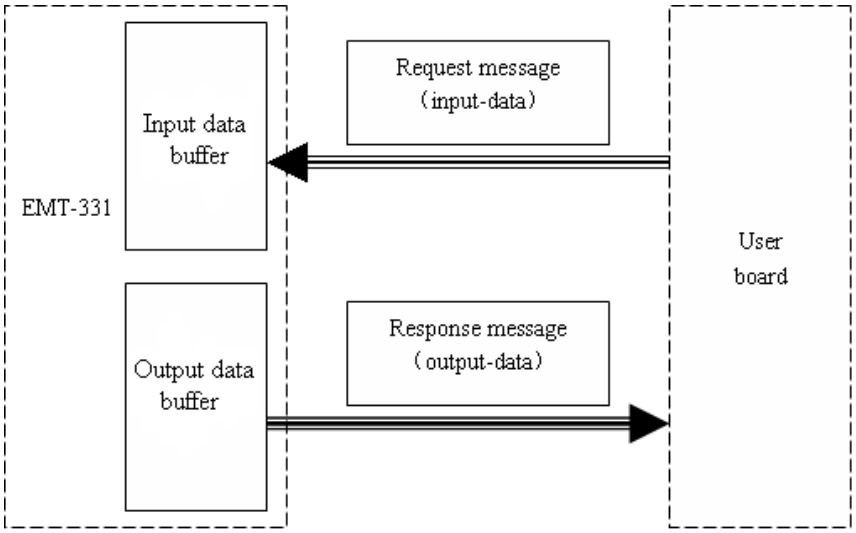
Eg:0C C0 A8 00 BB FF FF FF 00 C0 A8 00 01 95

The first byte is the length. The length does not include length of checksum. The each next four bytes are IP address, subnet mask, and gateway address. Last byte is checksum.

4.5 SiboTech-defined Protocol

User board is the communication initiator, and EMT-331Lite responses.

The request messages contain input data, and the response messages contain output data. The communication process is as follows:



1. Request message (user board -> module)

Byte	Description
0	message length includes all following bytes except the check sum byte , high-byte first
1	
2	Input data, high-byte first
…	
n	
n+1	Check sum, byte 0+byte 1+…+byte n

2. Response message of SiboTech-defined protocol (module -> user board)

Byte	Correct response	Byte	Incorrect response
0	message length includes all following bytes except the check sum byte , high-byte first	0	0x80
1		1	Data length is2
2	Output data, high-byte first	2	Error code
…		3	Extra error code
n		4	Check sum, byte 0+byte 1+byte 2+byte3
n+1	Check sum, byte 0+byte 1+…+byte n		

3. Error code

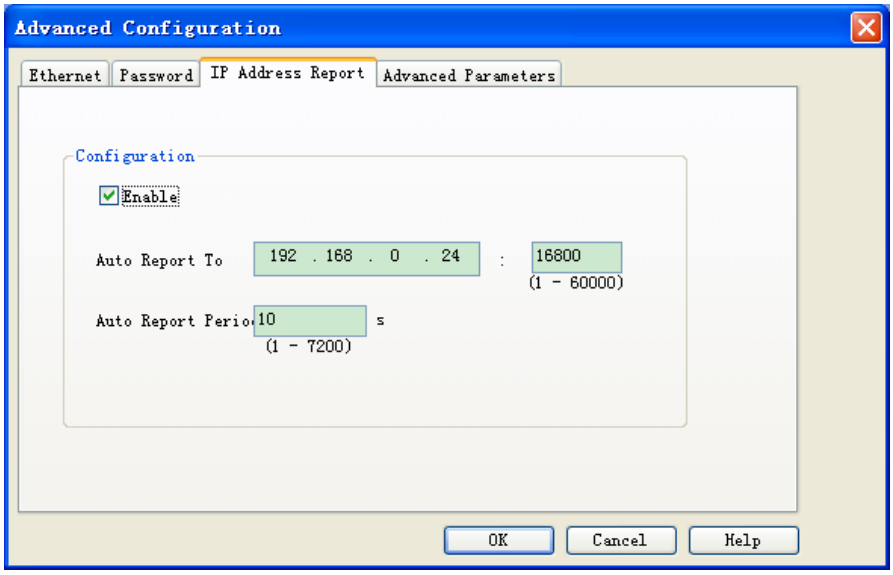
Index	Error code	Description
0	1	Check sum error
1	2	Data length error

4. Extra error code is always 0xFF.

5 IP Address Report

This feature allows EMT-331Lite sending the IP address report to the user's IP address,with user's cycle.

Open configuration software,search EMT-331Lite,then open the configuration or the advanced configuration.And open IP Address Report,As shown below:



Select “Enable”,enter the IP address and port number of terminal (Eg:computer) which receives reports.

NOTE:The terminal must be EMT-331Lite's IP address in the same network segment!

Fill in “Auto Report Period”.Download to EMT-331Lite and restart to use the function.

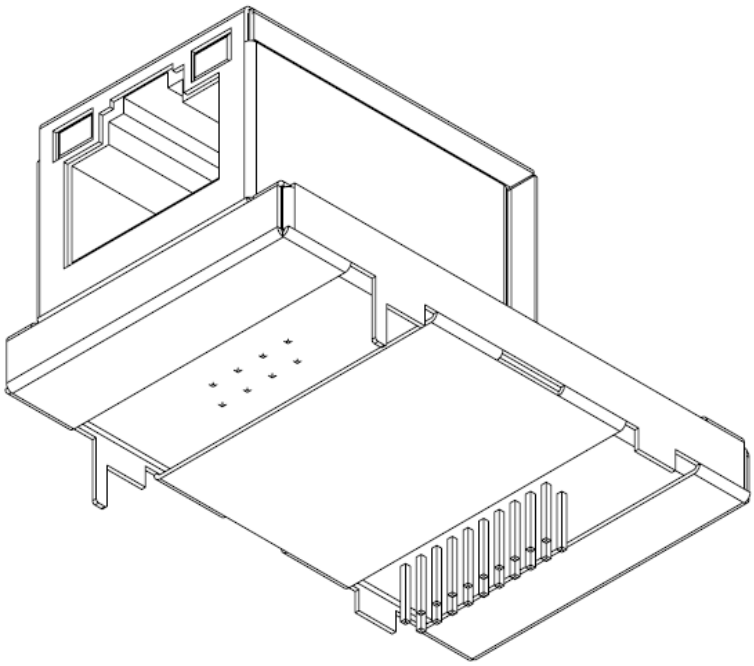
The following table is the packet format of IP Address Report.

Index	High Byte			Low Byte
0	“Sibo”			
1	“Tech”			
2	Length of Data			
3	“EMT-331Lite”			
4				
5				
6				
7	Serial Number			
8	Firmware Major Version Number		Firmware Minor Version Number	

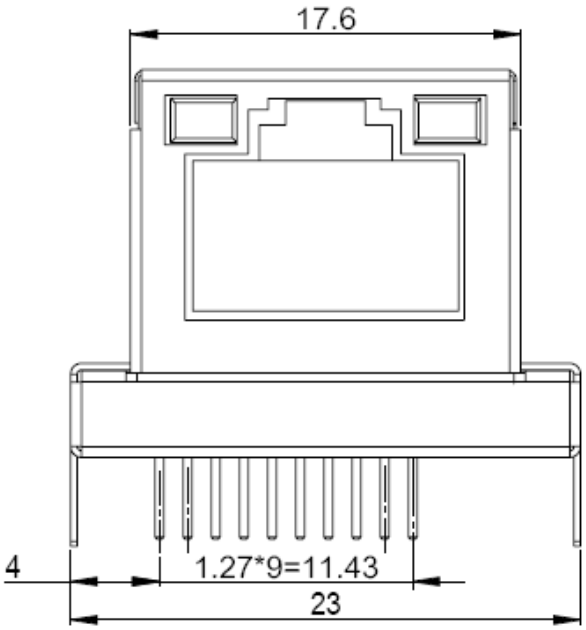
9	MAC Address	
10	MAC Address	Always 0
11	IP Address	
12	Subnet Mask	
13	Gateway Address	
14	Custom Name	
15		
16		
17		
18		

6 Dimension

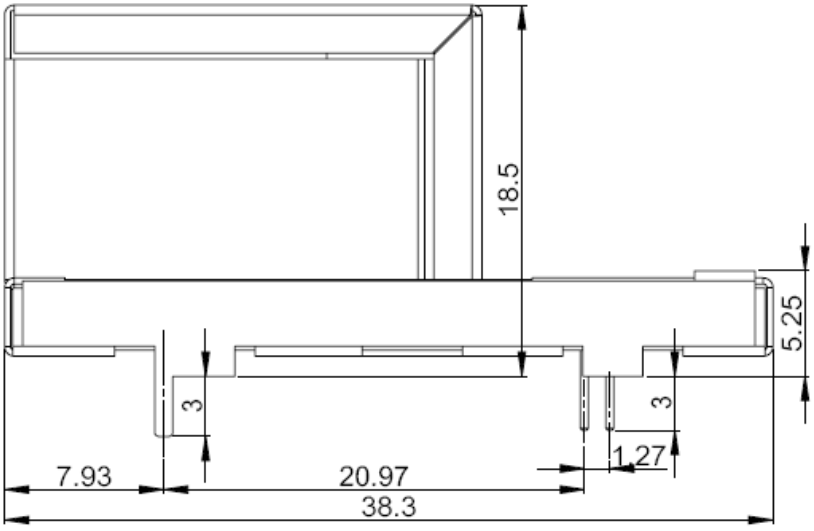
Unit: [mm]



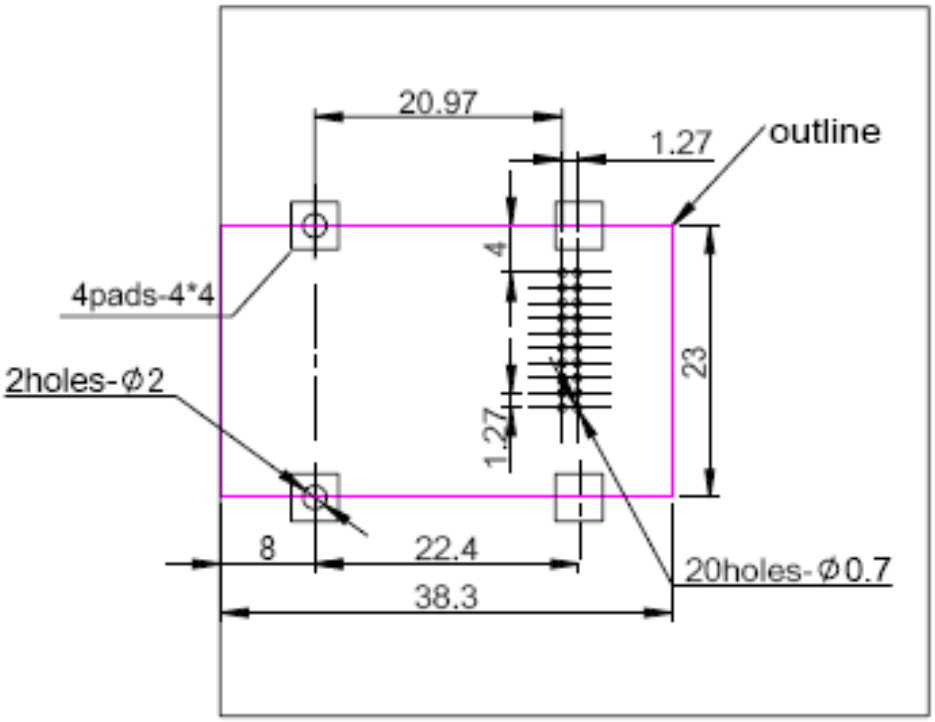
Front:



Side:

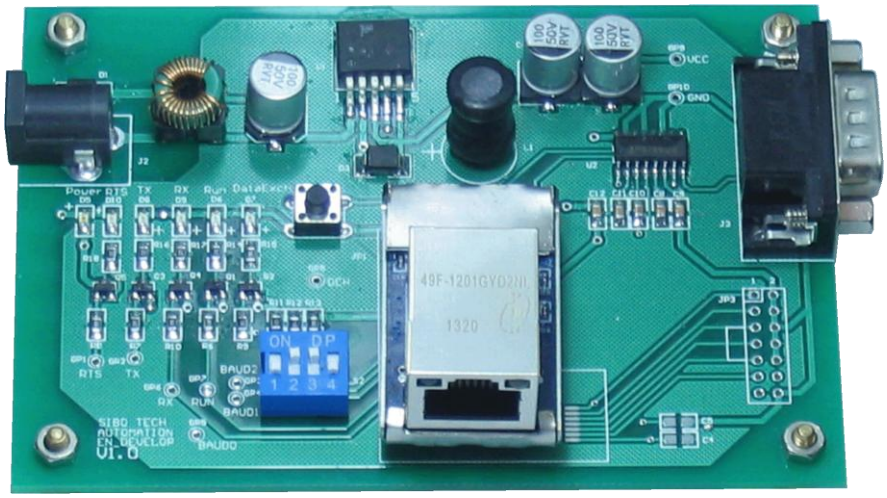


PCB dimension:



7 Development Board

7.1 Appearance



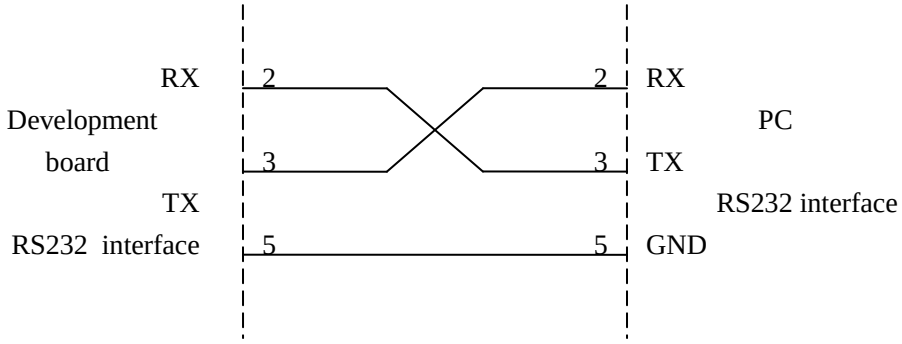
7.2 Function

7.2.1 RS232 Interface

RS232 interface is DB9 pin-connector, the description show as follow:

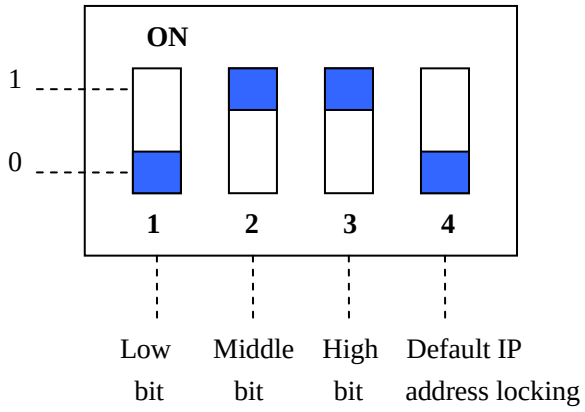
Pin	Signal	Description
2	RX	Connect with pin TX of RS232 of PC
3	TX	Connect with pin RX of RS232 of PC
5	GND	Connect with pin GND of RS232 of PC

DB9 hole-connector crossover cable must be used when connect the board with RS232 interface of PC:



7.2.2 Baudrate Setting Switch

The 4-bit DIP switch on the development board is used to set the serial (UART) baud rate and default IP address locking:



Corresponding relationship of baud rate is as follows:

Index	High bit	Middle bit	Low bit	Corresponding baud rate (bps)
0	0	0	0	Reserve
1	0	0	1	Reserve
2	0	1	0	9600
3	0	1	1	19200
4	1	0	0	38400
5	1	0	1	57600
6	1	1	0	115200
7	1	1	1	230400

The baud rate showing in the picture is 115200bps.

The fourth bit of DIP is “Default IP address locking” bit. When the bit is “ON”, the module starts the embedded Web Server with default IP configurations, which can be open with IE browser on the PC to restore default configurations or to update the firmware. However it can’t exchange data between the host and Modbus TCP. The default IP configurations are as follows:

IP address: 192.168.0.11

Subnet mask: 255.255.255.0

Default gateway: 192.168.0.1

7.2.3 Reset Key

The key on the development board is the reset key, which is used to manual reset EMT-331Lite.

7.2.4 LED

There are six indicators on the development board, and the description is as follows:

Index	Name	Description
0	Power	Power indicator, On: Power on; Off: Power off
1	RTS	Reserve
2	TX	EMT-331Lite'UART transmits indicator; Blinking: EMT-331Lite'UART is transmitting data; Off: EMT-331Lite'UART isn't transmitting data.
3	RX	EMT-331Lite'UART receives indicator. Blinking: EMT-331Lite'UART is receiving data; Off: EMT-331Lite'UART isn't receiving data.
4	Run	EMT-331Lite status indicator, On: In run status; Off: In start-up status.
5	DataExch	EMT-331Lite data-interchange indicator, On: In data-exchange status; Off: Not in data-exchange status.

8 Configuration Software

Put the product CD into the computer CD drive, open the CD, and install the configuration software EMT-123. Follow the prompts to complete the installation. Then open the configuration software and finish the configuration of EMT-331Lite.

System Requirements:

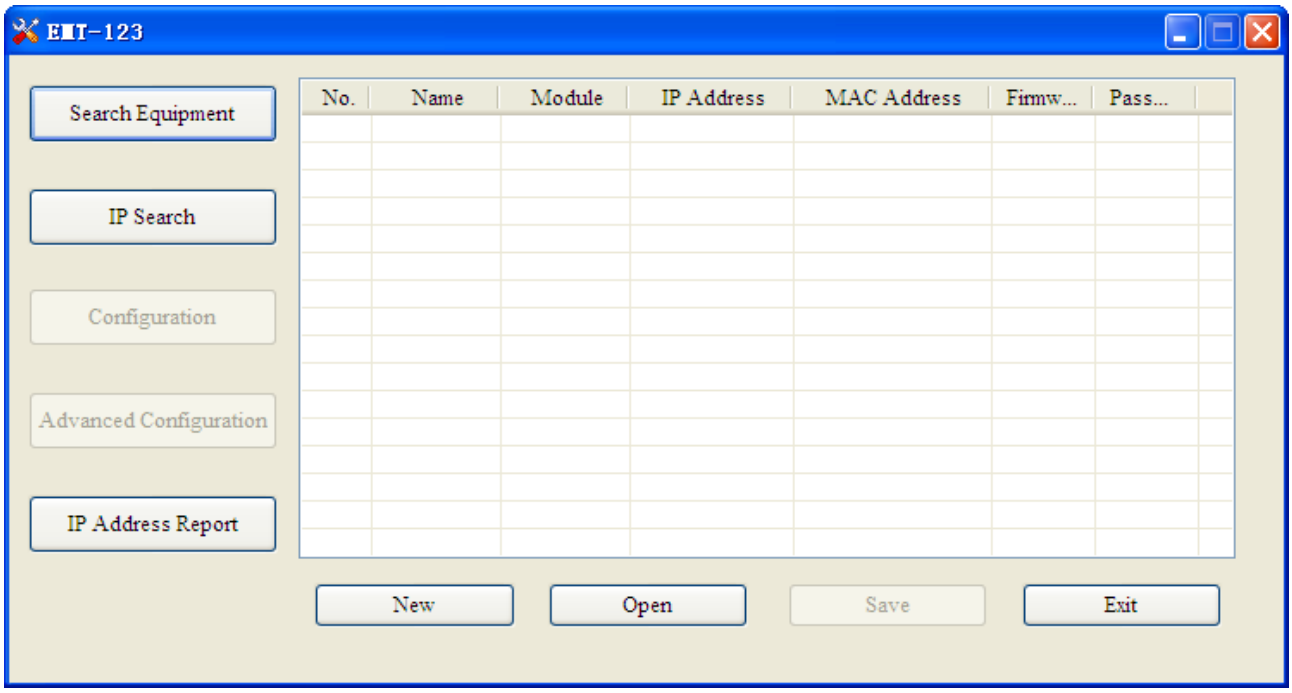
- PC with 1 GHz processor or higher
- Windows® XP/Windows® 7
- Free disk space: min. 130 M Byte
- CD ROM drive
- RAM: min. 256 M Byte, recommended 512 M Byte
- Keyboard and Mouse

Note:

The manufacturer default settings of EMT-331Lite are 192.168.0.11, subnet mask is 255.255.255.0, and default gateway is 192.168.0.1.

8.1 Overview

EMT-123 is a product based on Windows platform, and is used to configure parameters of EMT-331Lite. Before running the software, make sure the computer and EMT-331Lite have been configured in the same network. Double click the icon to run the EMT-123 and its main window will appear:

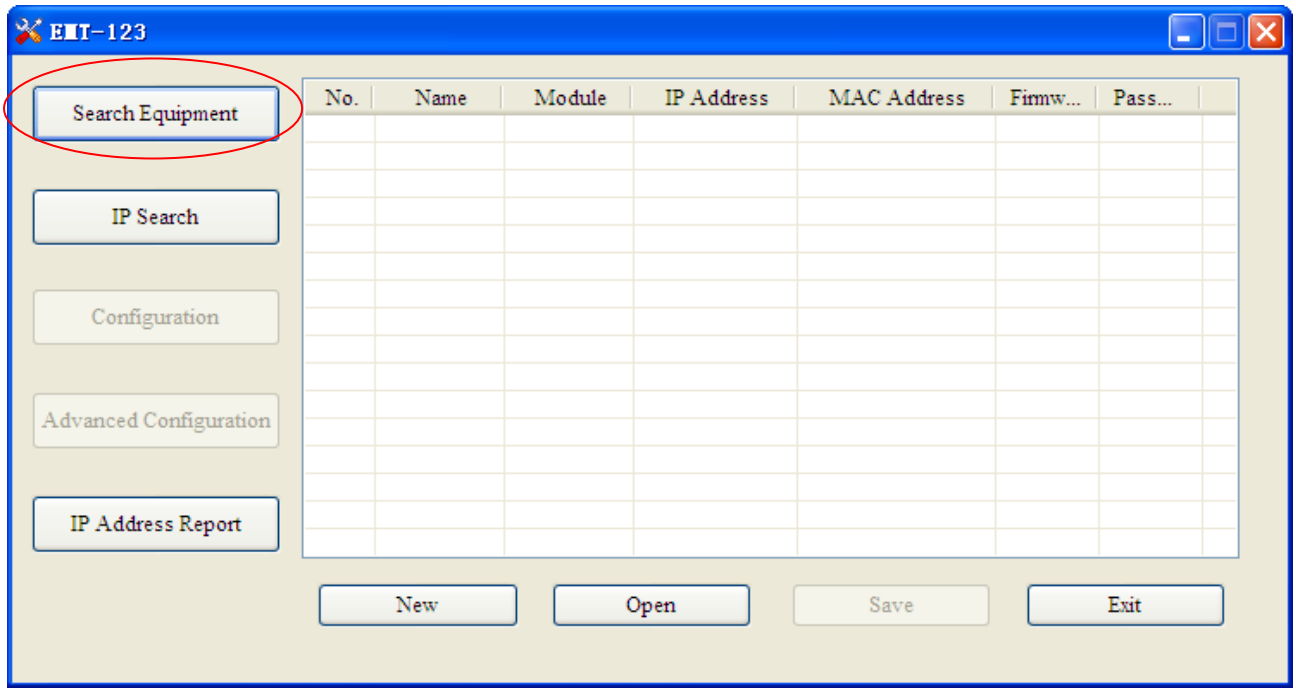


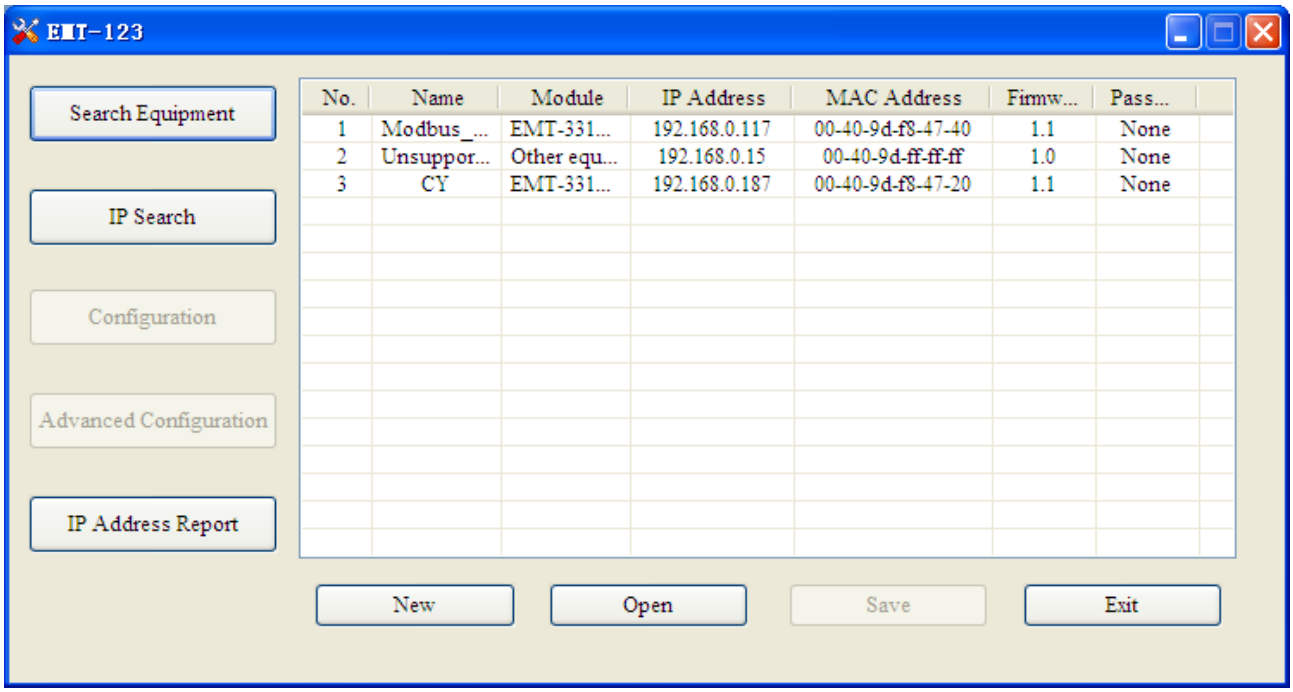
8.2 Search Equipment

Before parameters configuration of EMT-331Lite, you need to search the equipment. The software provides two ways to search the equipment. Followings are the two ways.

8.2.1 Search All Equipments of Ethernet

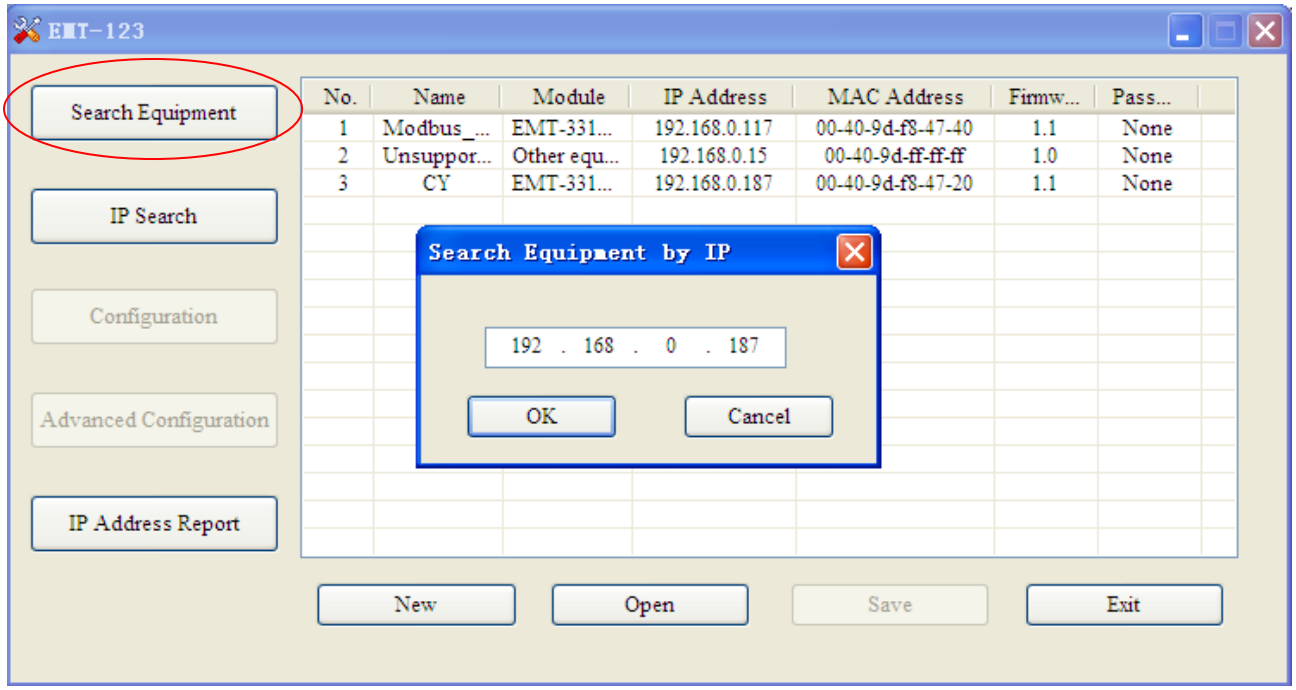
Click “Search Equipment” button in the main window, the software will search all of the available EMT-331Lite equipments and list them in the table on the right side.

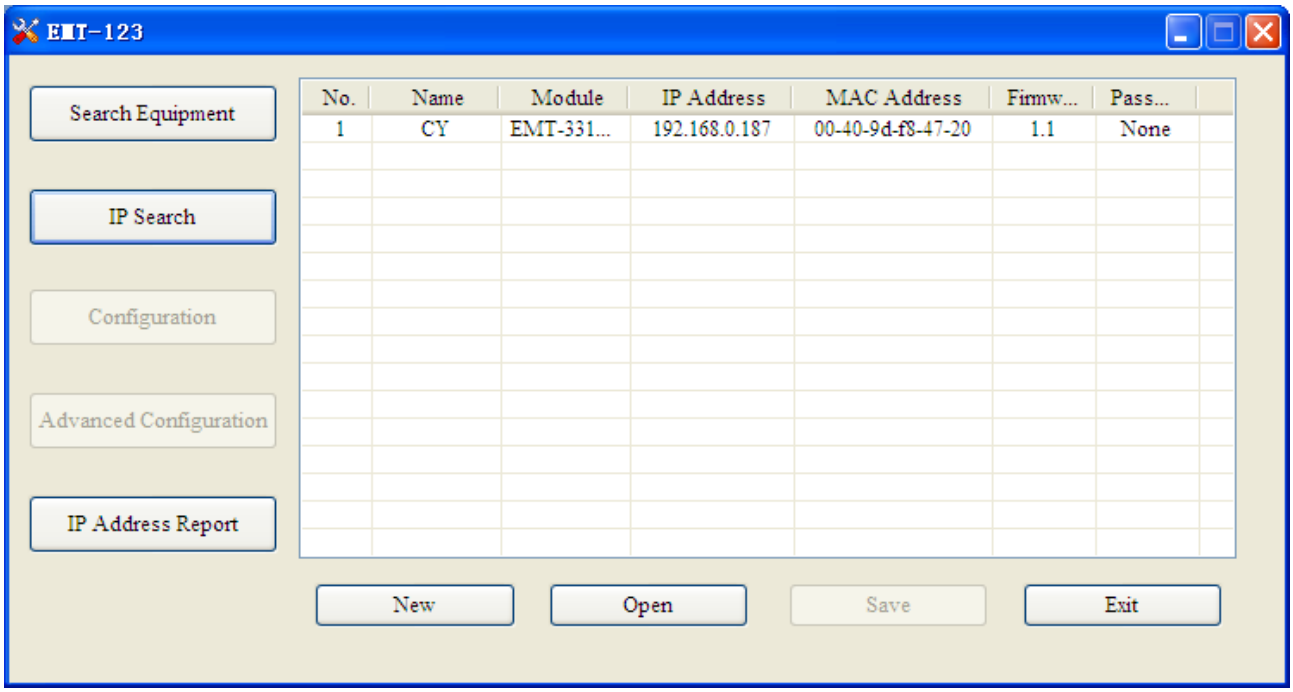




8.2.2 IP Search

Click “IP Search” button in the main window, and there will be popping up a dialog box:





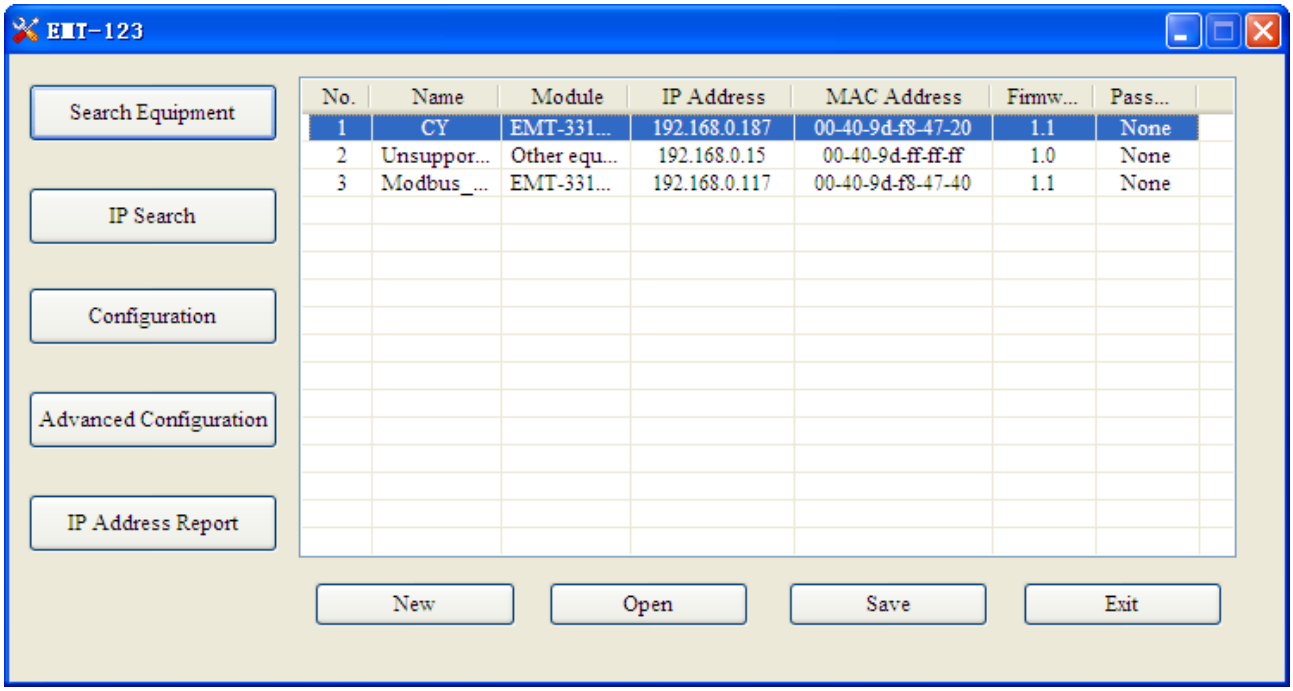
After entering the wanted IP address, click OK, the software will search EMT-331Lite with the named IP address in the network, and list the information of the equipment in the table.

Note:

If you have selected “IP Search”, correct IP address is needed; otherwise, it will search for nothing.

8.3 Advanced Configuration

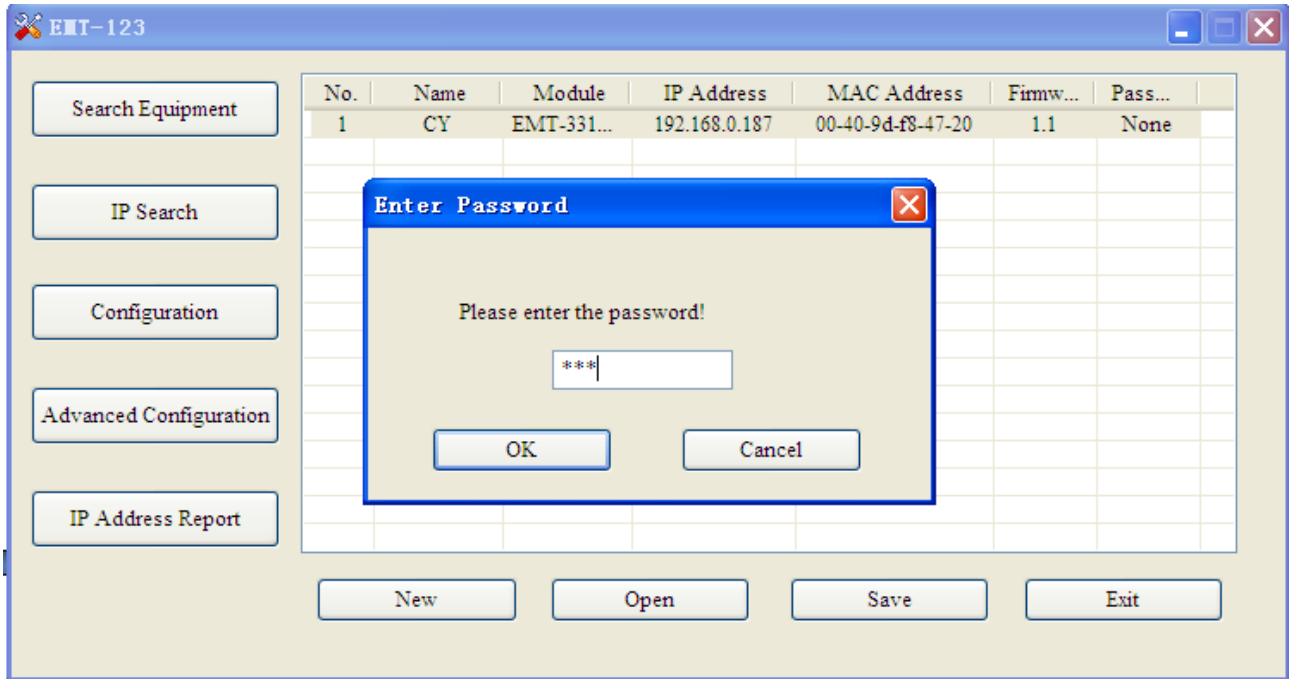
Select one equipment in the right table, then “Configuration”, “Advanced Configuration” and “Save” buttons will become available:



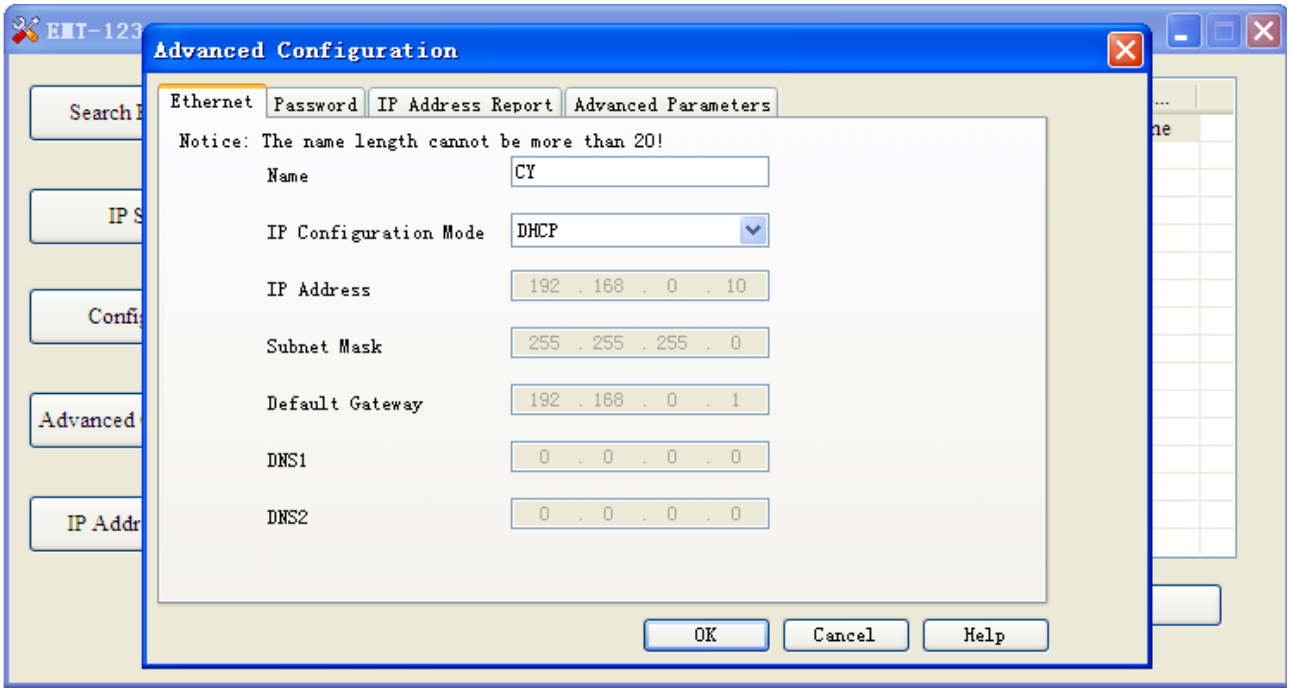
Click “Advanced Configuration” button, a password dialog box will pop up if the equipment has been set up with a password; The Advanced Configuration window will appear when your entering password is correct.

Note:

If the module has a user password, column "Password" of the table will show "Required", otherwise, it will show "None" even if the module has an administrator password.



If the equipment has no password setting, you can directly enter the Advance Configuration window:



8.3.1 Ethernet Parameters

Ethernet parameters include: “Name”, “IP Configuration Mode”, “IP Address”, “Subnet Mask”, “Default Gateway”, “DNS1”, and “DNS2”.

Name——Enter a name to identify the EMT-331Lite module;

IP Configuration Mode——Set the device's IP address configuration mode;

IP Address——Set the device's IP address;

Subnet Masks——Set the subnet mask of the device;

Default Gateway——Set the default gateway address of the device;

DNS1——0.0.0.0 (currently only support 0.0.0.0)

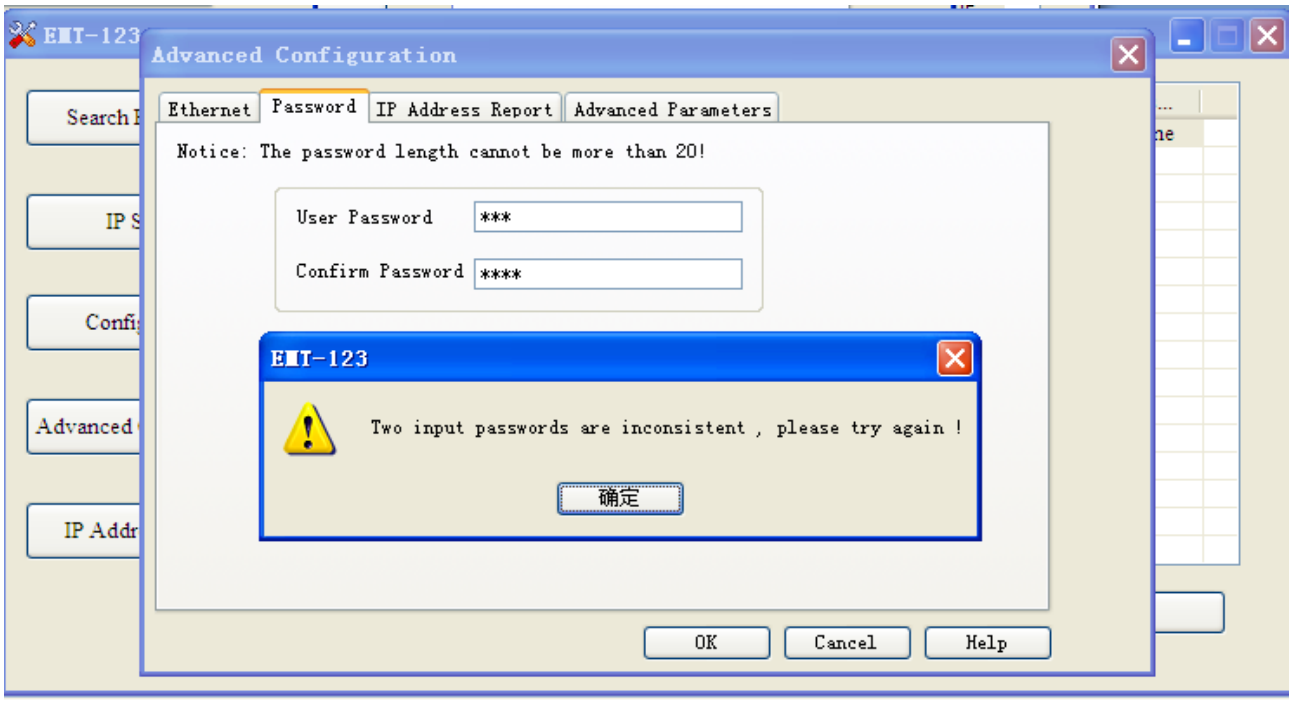
DNS2——0.0.0.0 (currently only support 0.0.0.0)

Note:

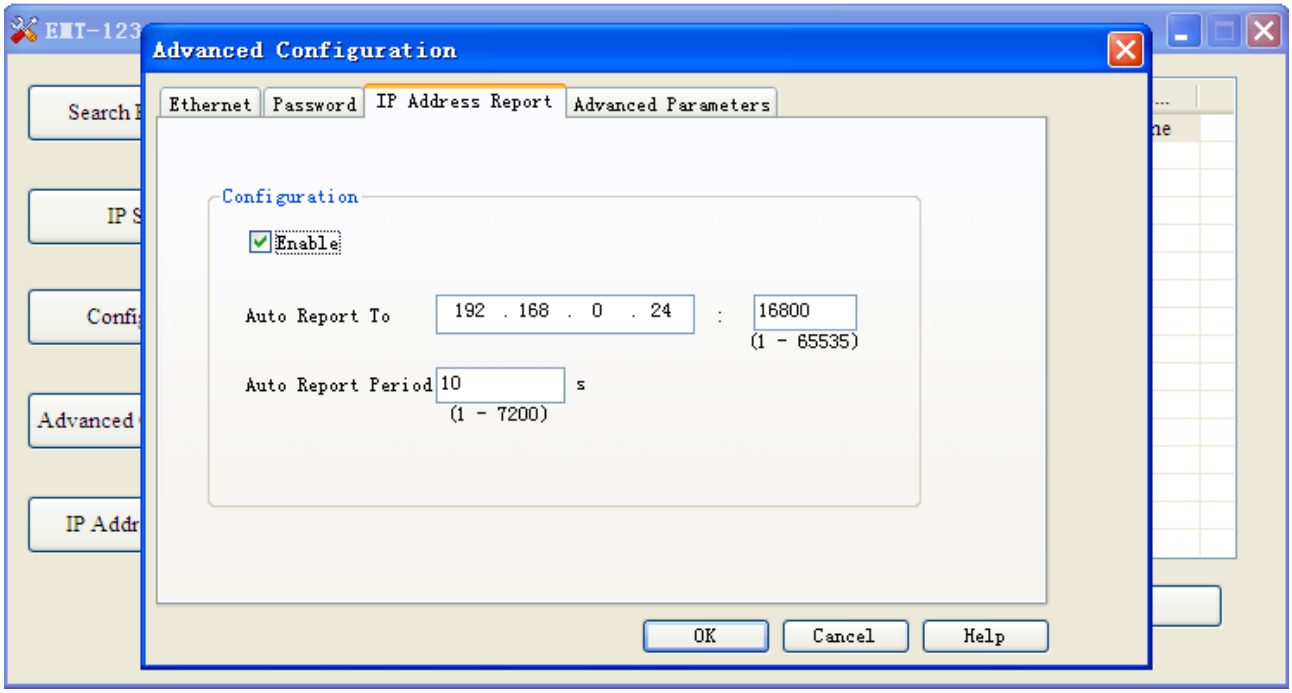
The name's max length is 20 characters and cannot have spaces.

8.3.2 Password

You can set up user password and admin password in this part. After entering the password, you need to confirm it, otherwise, there will display an alert box:



8.3.3 IP Address Report

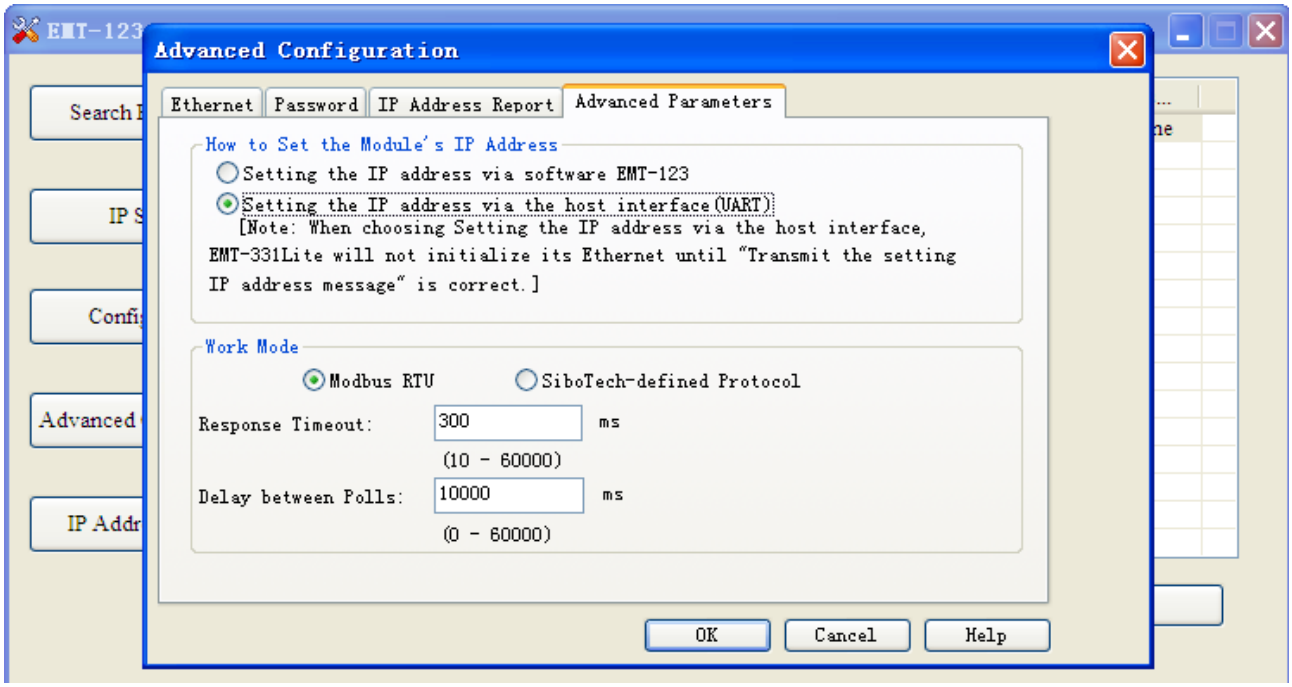


Select check box before the “Enable” , the parameters can be configured:

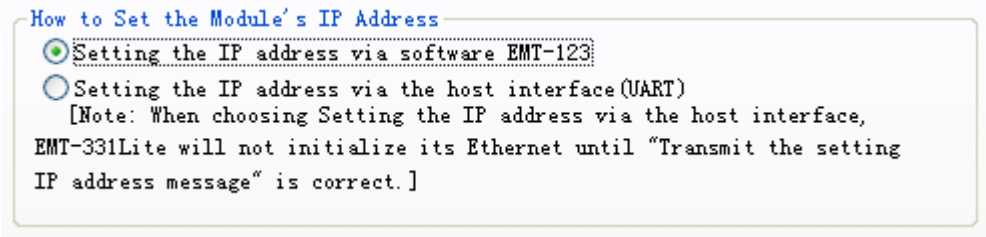
Auto Report To ----- Set the remote Auto IP report server’ s IP address and UDP port;

Auto Report Period ----- The time interval between two IP report messages

8.3.4 Advanced Parameter



How to set the module's IP address



Setting the IP address via software EMT-123

Setting the IP address via the host interface (UART)

Note:

When choosing "Setting the IP address via the host interface", EMT-331Lite will not initialize it's Ethernet until "Transmit the setting IP address message" is correct.

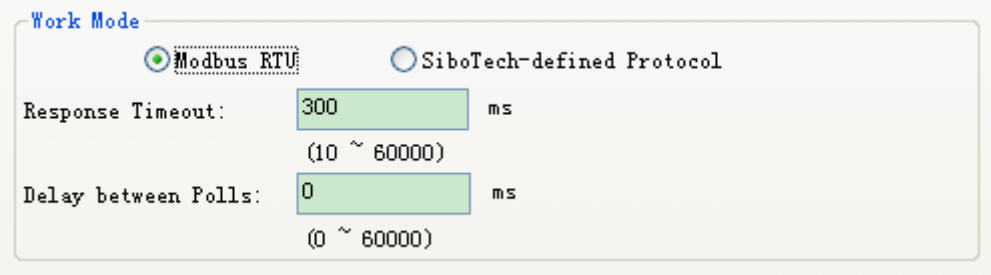
Work Mode:

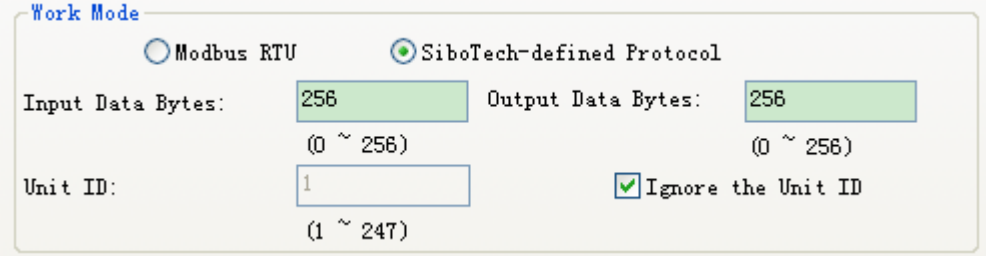
There are two kinds of work modes: “Modbus RTU” and “SiboTech-defined protocol”.

In “Modbus RTU” mode, you need to set “Response Timeout” and “Delay between Polls”.

Response Timeout-----The maximum time between the beginning of sending requests by the UART and receiving response completely, and the range is 10ms~60000ms.

Delay between Polls-----The minimum time between receiving response completely from the UART and sending the next request, and the range is 0ms~60000ms.





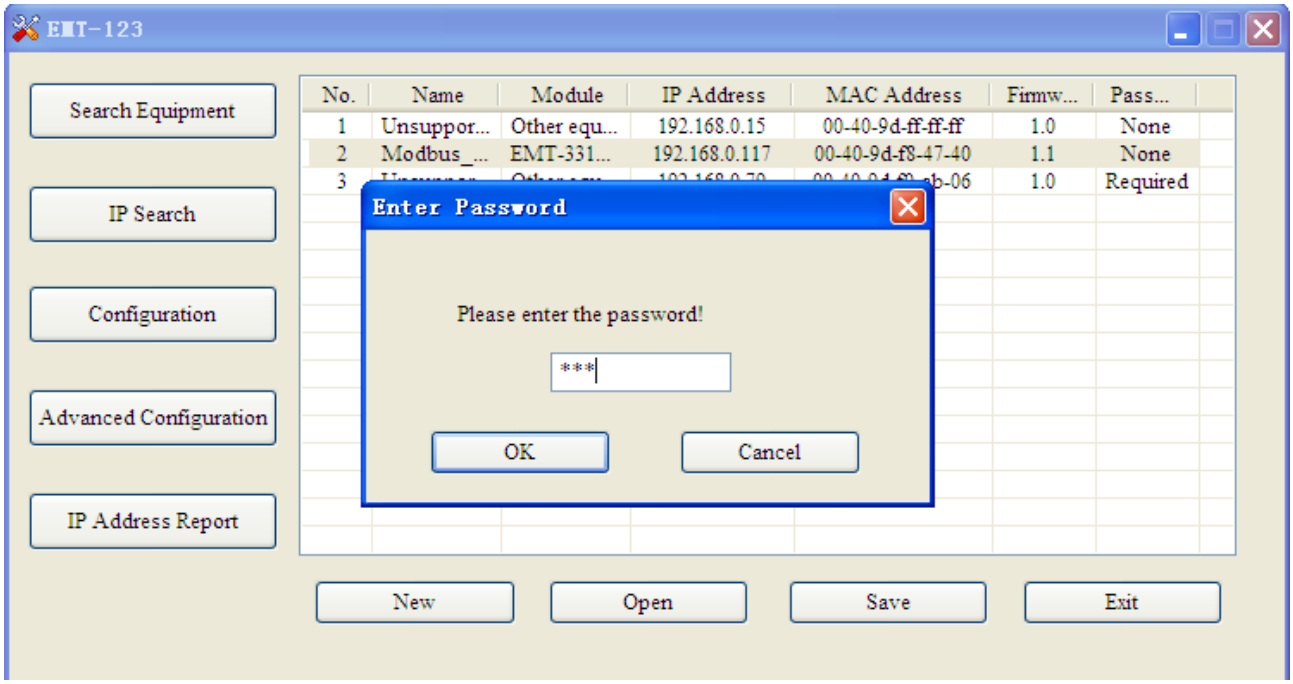
In “SiboTech-defined protocol” mode, you need to set “Input Data Bytes”, “Output Data Bytes” and “Unit ID”.

Input Data Bytes, Output Data Bytes----- Set input buffer’s size and output data buffer’s size, and each data buffer's range is 0 bytes~256bytes.

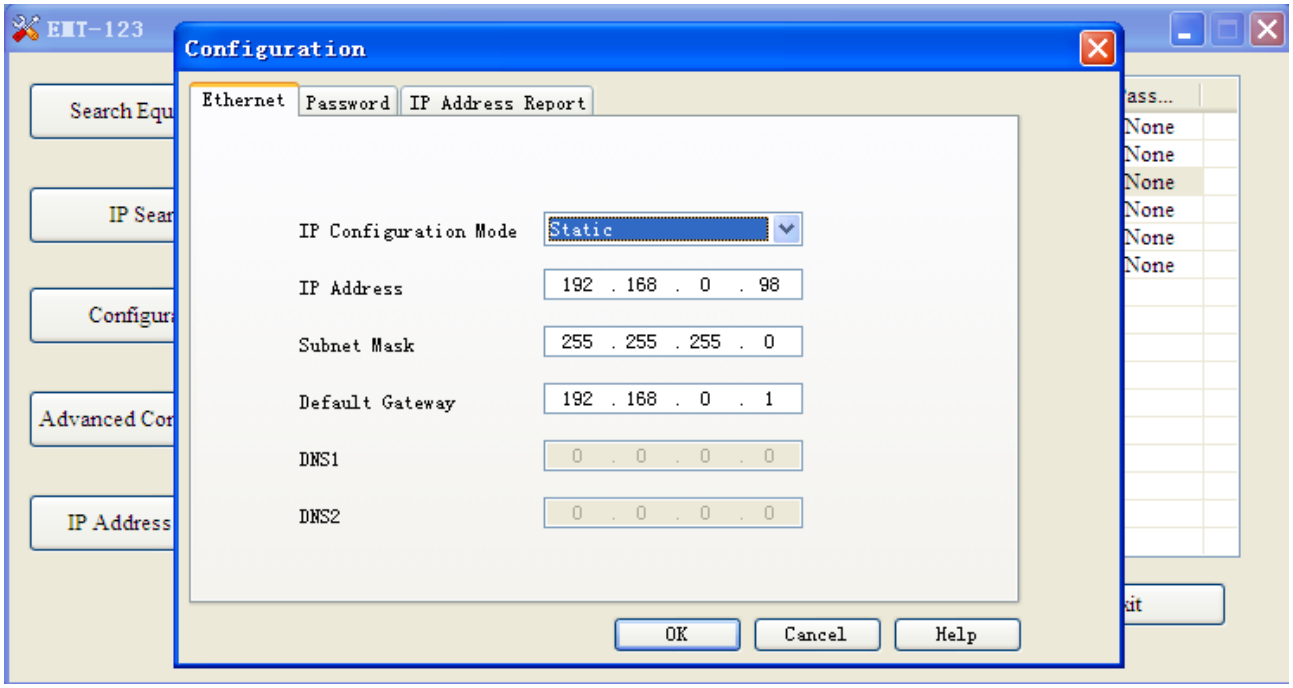
Unit ID-----The device address of Modbus TCP slave, and it could be ignored.

8.4 Configuration

Click “Configuration” button, or double click the selected item in the right table, a password dialog box will pop up if the equipment has been set up with a password; The Configuration window will appear when your entering password is correct.



If the equipment has no password setting, you can directly enter the configuration window:



8.4.1 Ethernet Parameters

Ethernet parameters include: “IP Configuration Mode”, “IP Address”, “Subnet Mask”, “Default Gateway”, “DNS1”, and “DNS2”.

IP Configuration Mode——Set the device's IP address configuration mode;

IP Address——Set the device's IP address;

Subnet Masks——Set the subnet mask of the device;

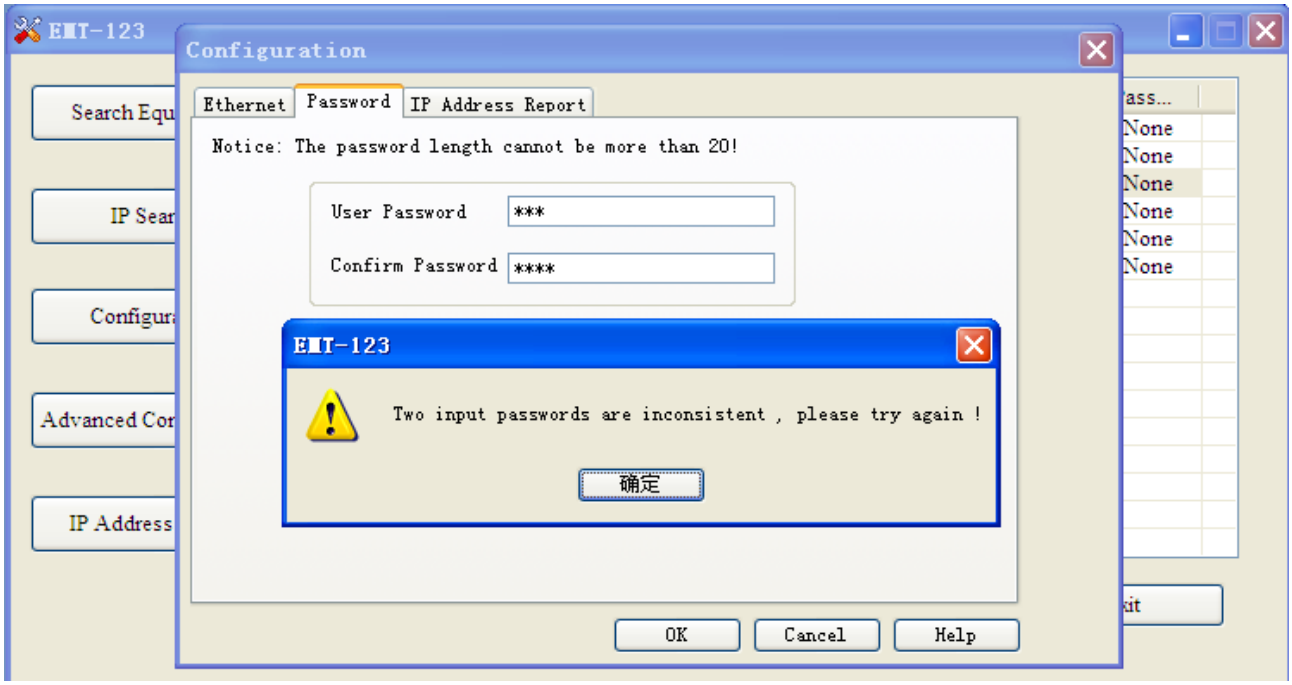
Default Gateway——Set the default gateway address of the device;

DNS1——0.0.0.0 (currently only support 0.0.0.0)

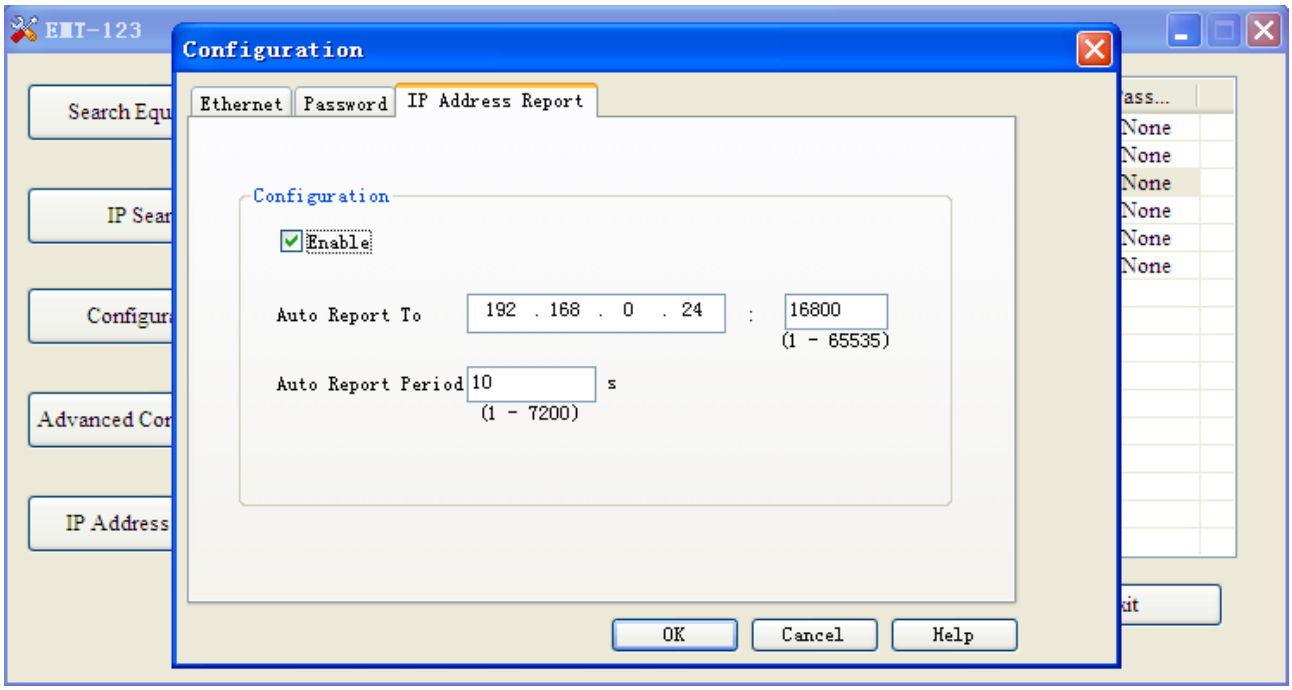
DNS2——0.0.0.0 (currently only support 0.0.0.0)

8.4.2 Password

You can set up user password in this part. After entering the password, you need to confirm it, otherwise, there will display an alert box:



8.4.3 IP Address Report

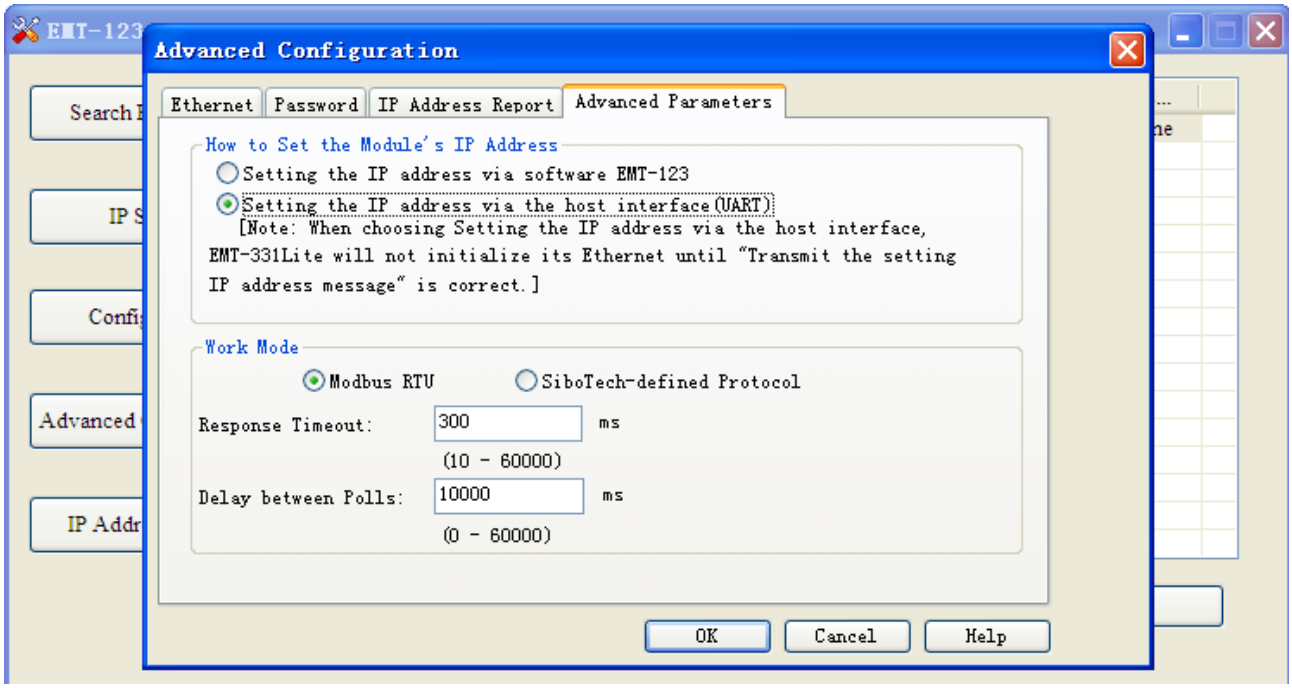


Select the check box before the “Enable”, the parameters can be configured:

Auto Report To ----- Set the remote Auto IP report server’s IP address and UDP port;

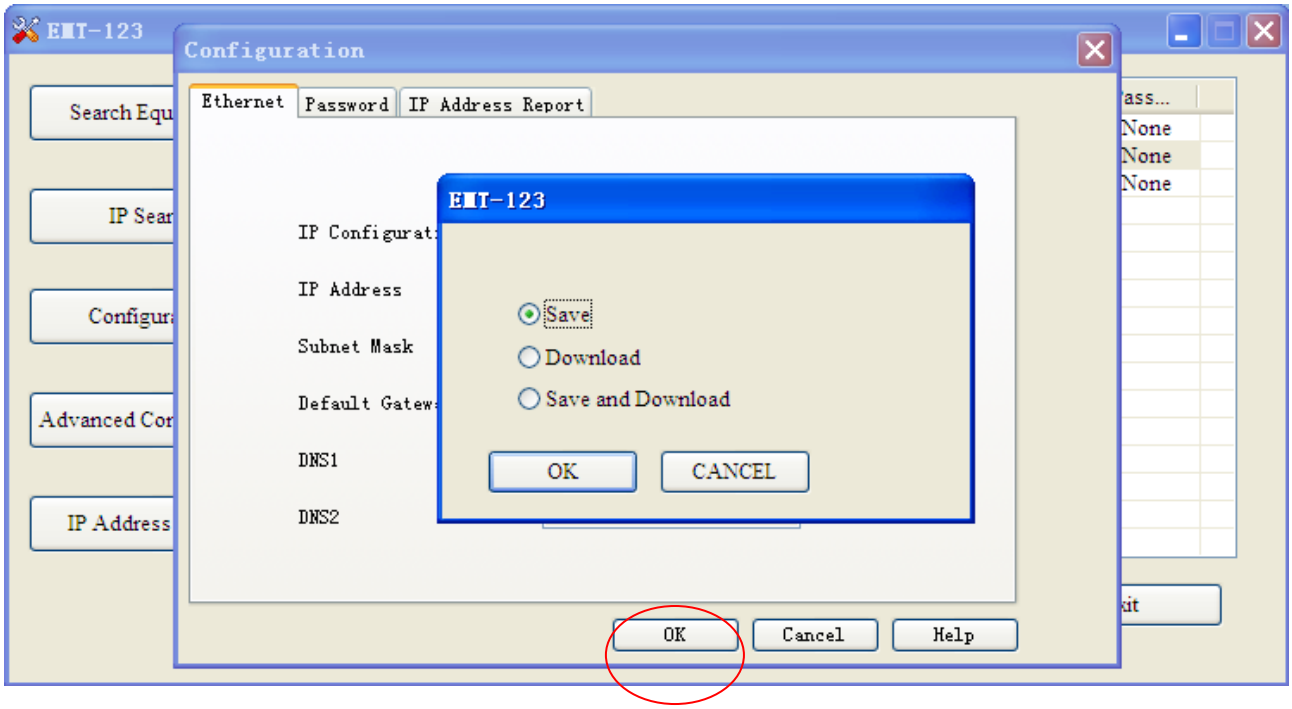
Auto Report Period ----- The time interval between two IP report messages

8.5 OK, Cancel and Help



8.5.1 OK

After configuring parameters, you can click "OK" button to write the configuration into the EMT-331Lite module.

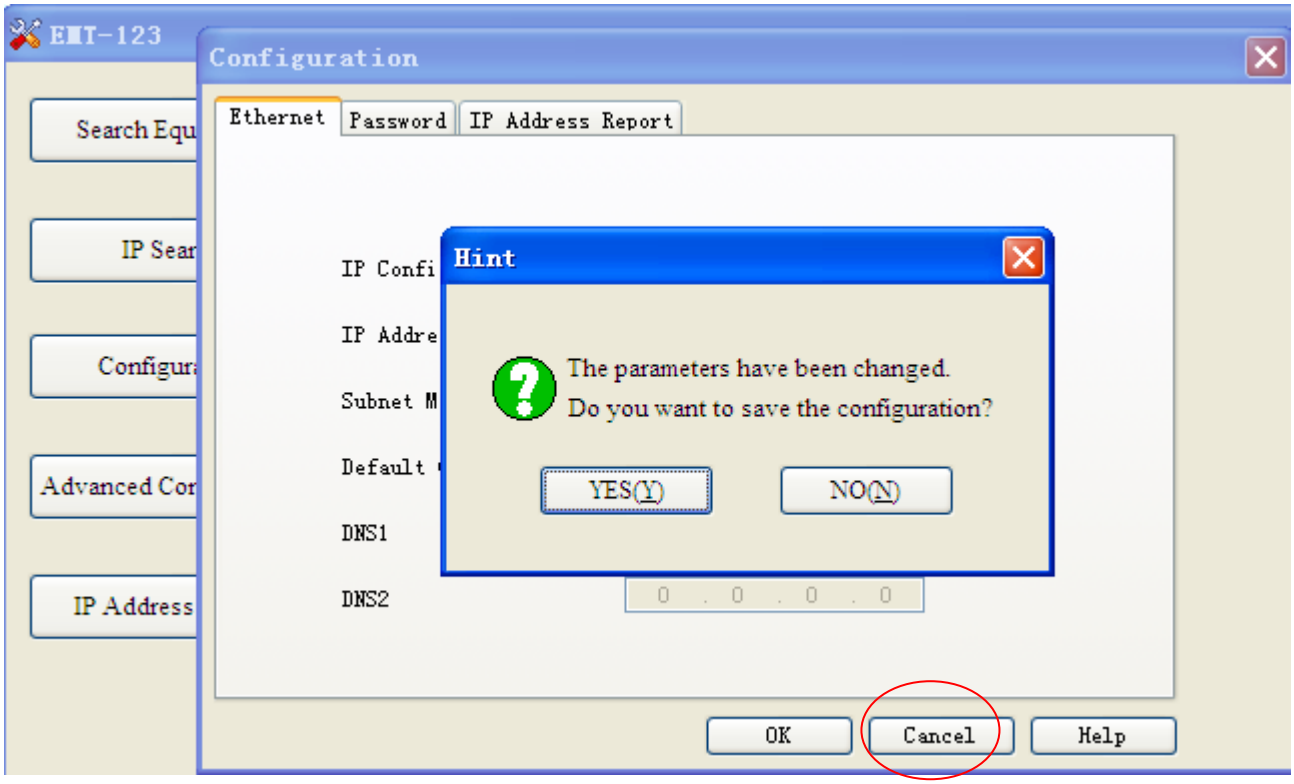


Save——Save the configuration as ".inf" format file to local disk;

Download——Download the configuration to the EMT-331Lite module;

Save and Download——Save to the local disk and download to the EMT-331Lite module.

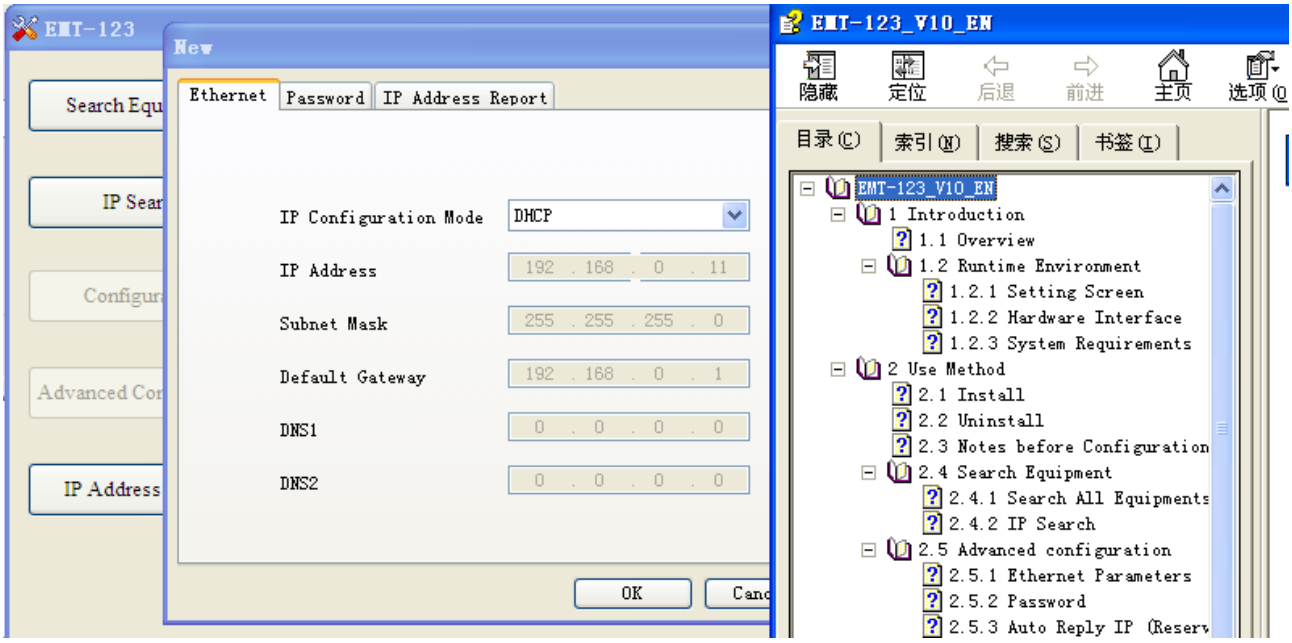
8.5.2 Cancel



Click yes to save the configuration to the local disk.

8.5.3 Help

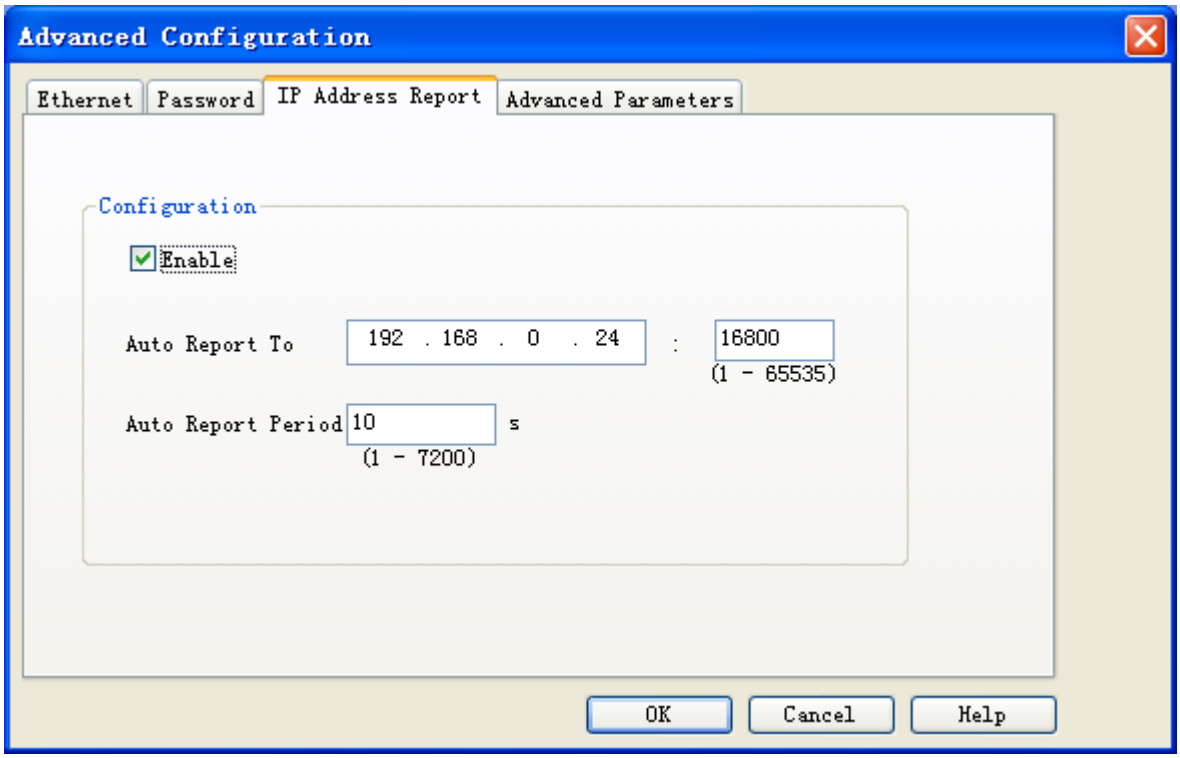
Open the software manual.



8.6 IP Address Report

When EMT-331Lite is used in a dynamic IP environment, users will spend more time with IP management tasks. EMT-331Lite Series products help out by periodically reporting their IP address to the EMT-123 software, in case the dynamic IP has changed.

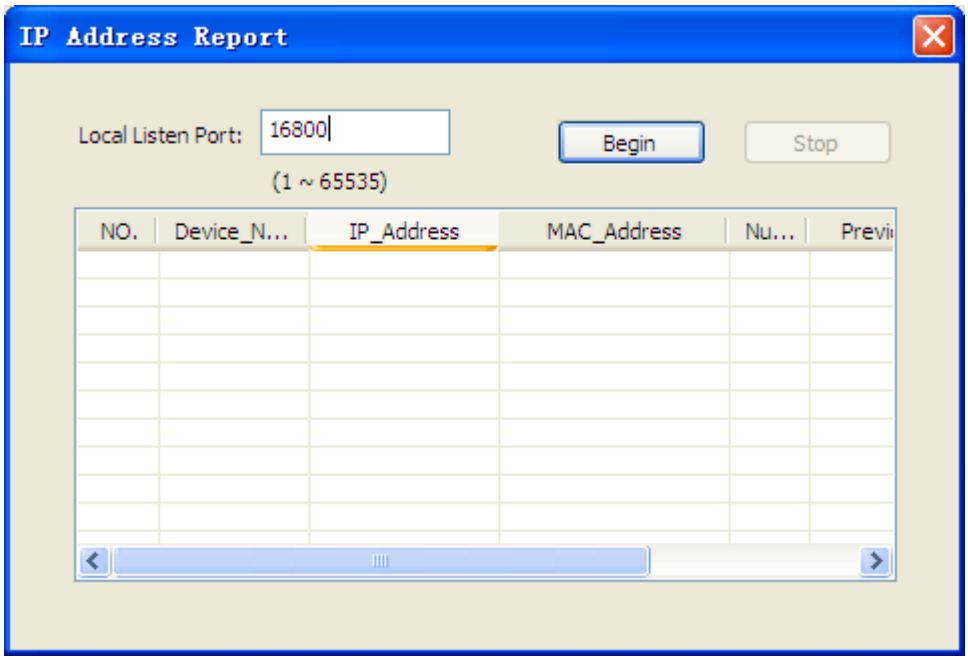
8.6.1 Parameter configuration



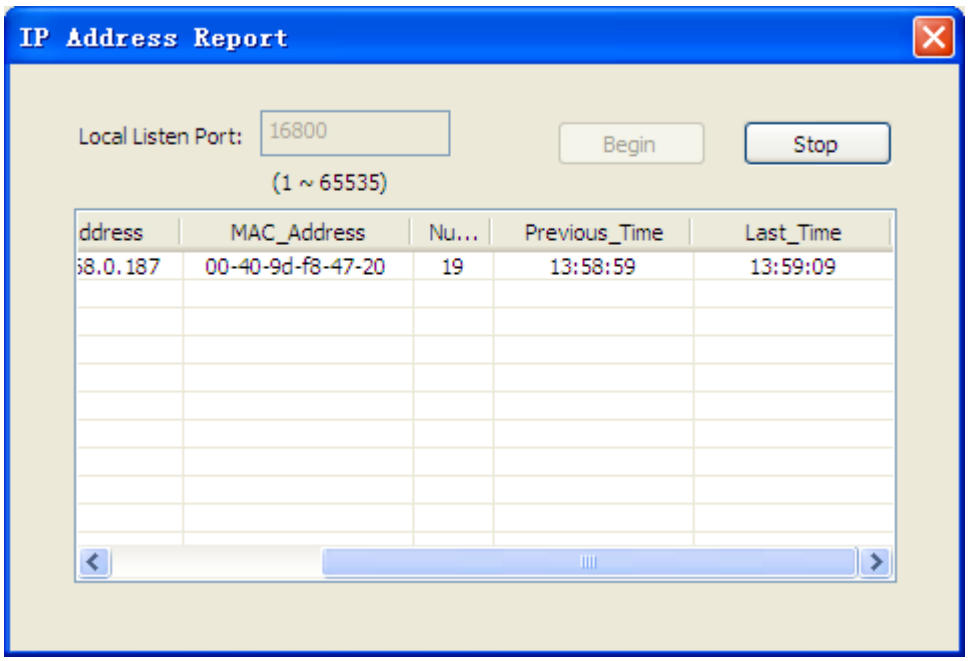
Fill the "Auto Report To" with the current computer IP address and port;

Fill the "Auto Report Period" with the integer between 1 and 7200.

8.6.2 IP Address Report

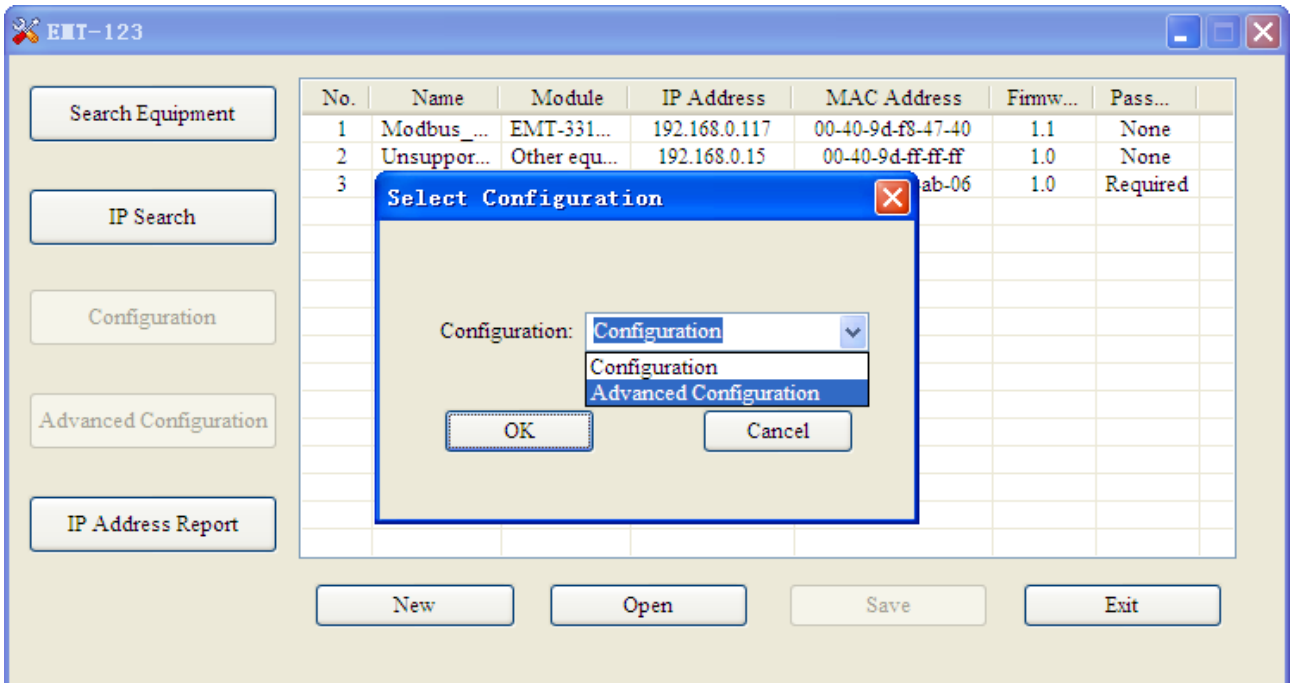


Configure the Local Listen Port to be same as the port of "Auto Report To" setting, and then click “begin”

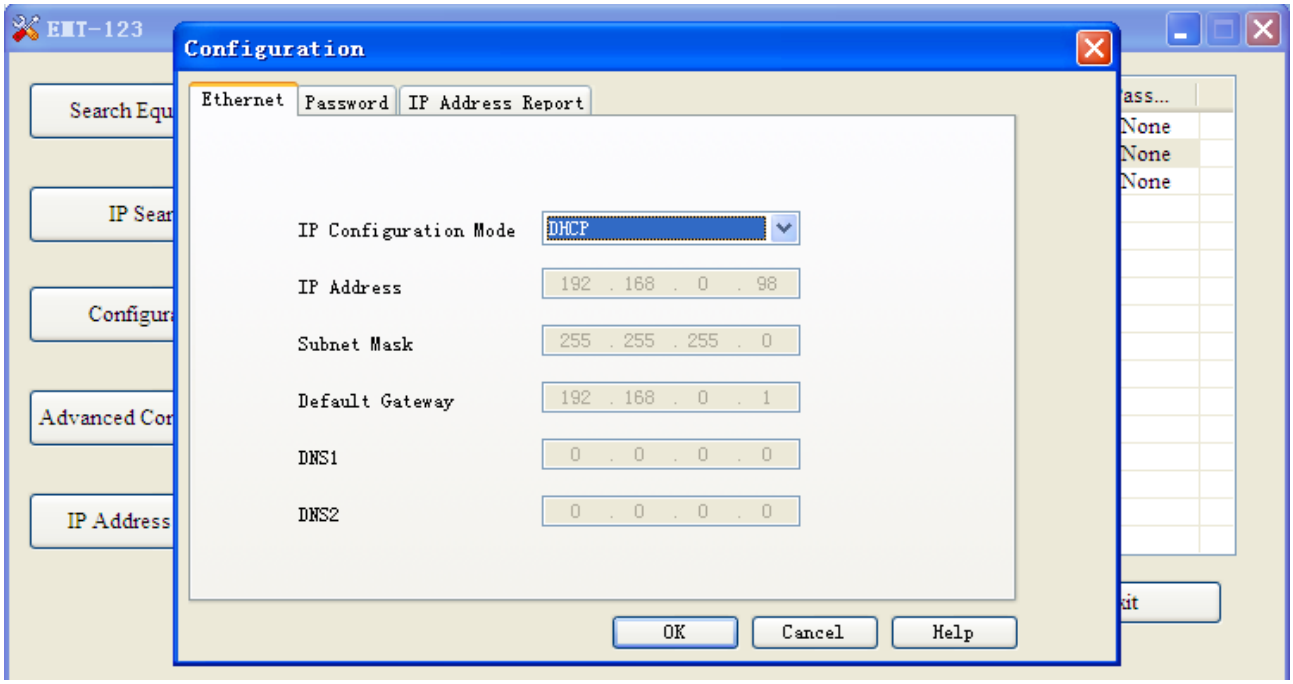


8.7 New

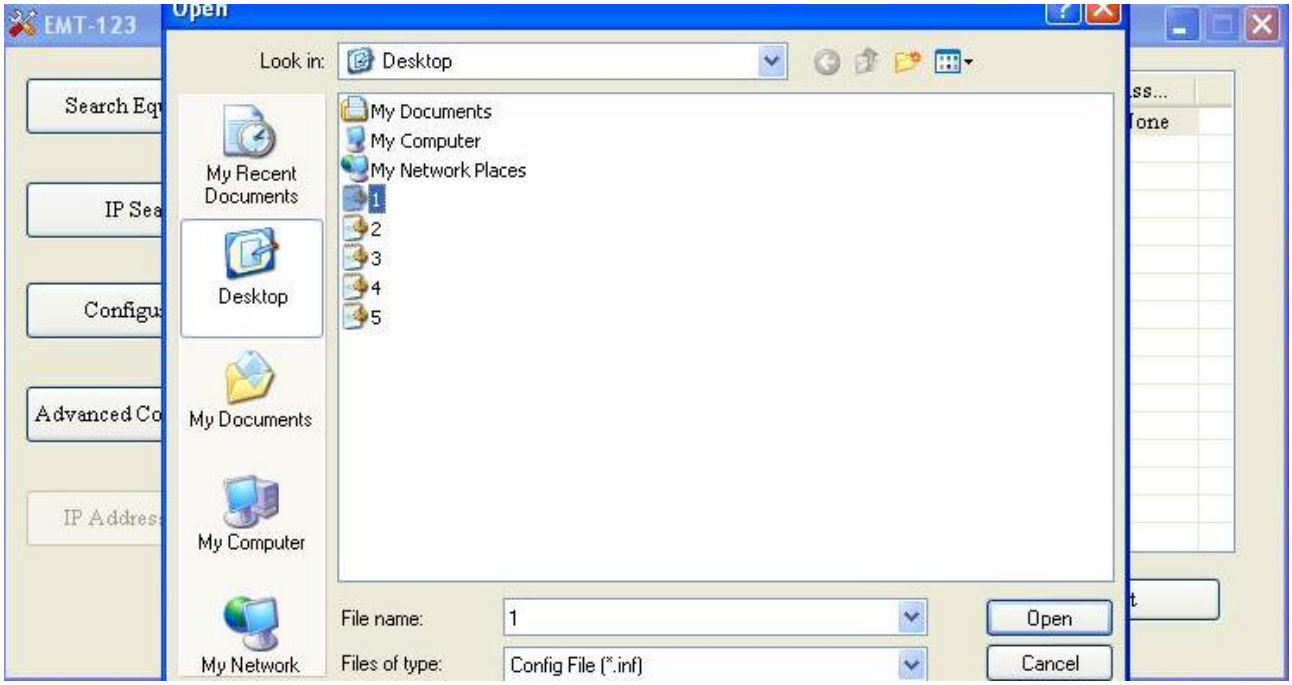
Click “New” and select a configuration mode:



Enter the new configuration interface. All of the data is set up with factory defaults.



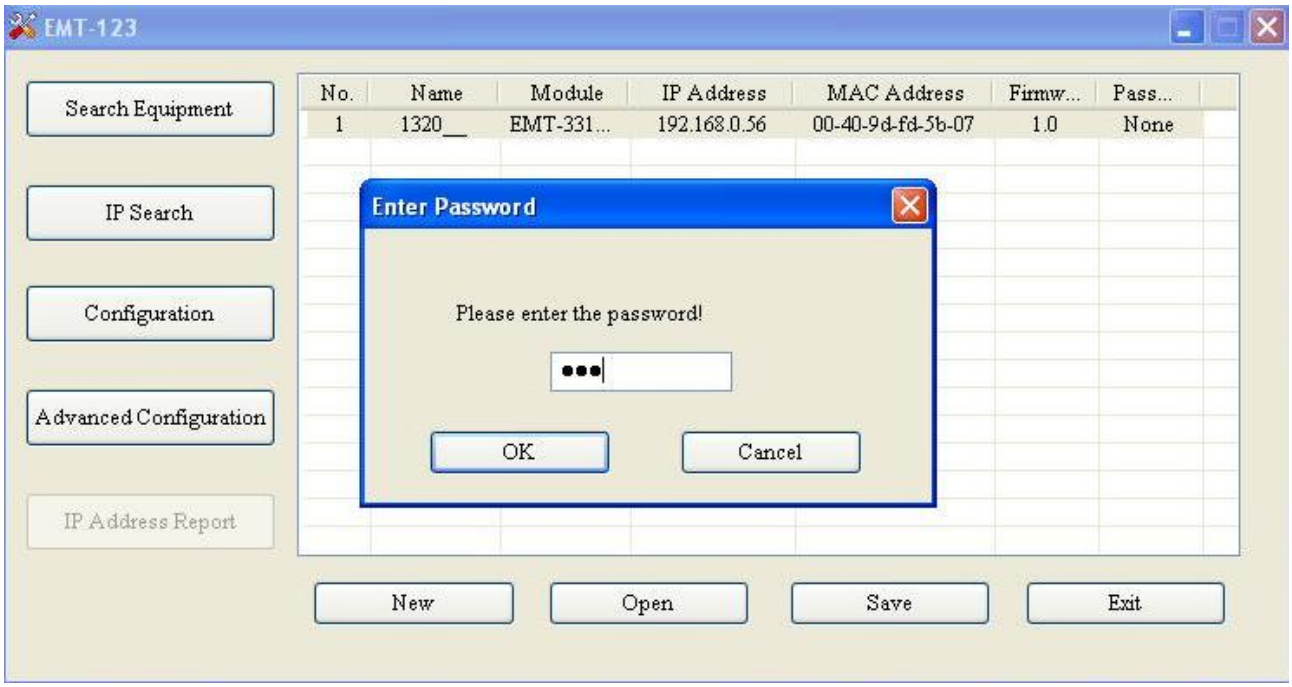
8.8 Open



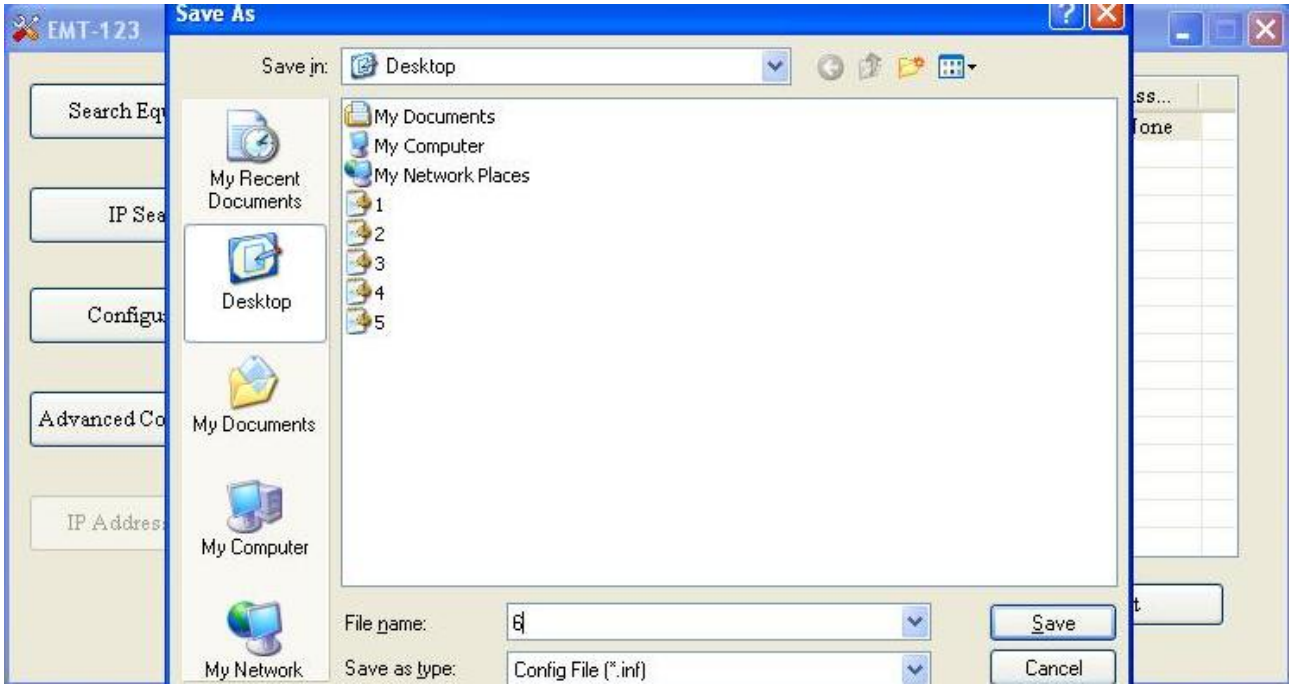
8.9 Save

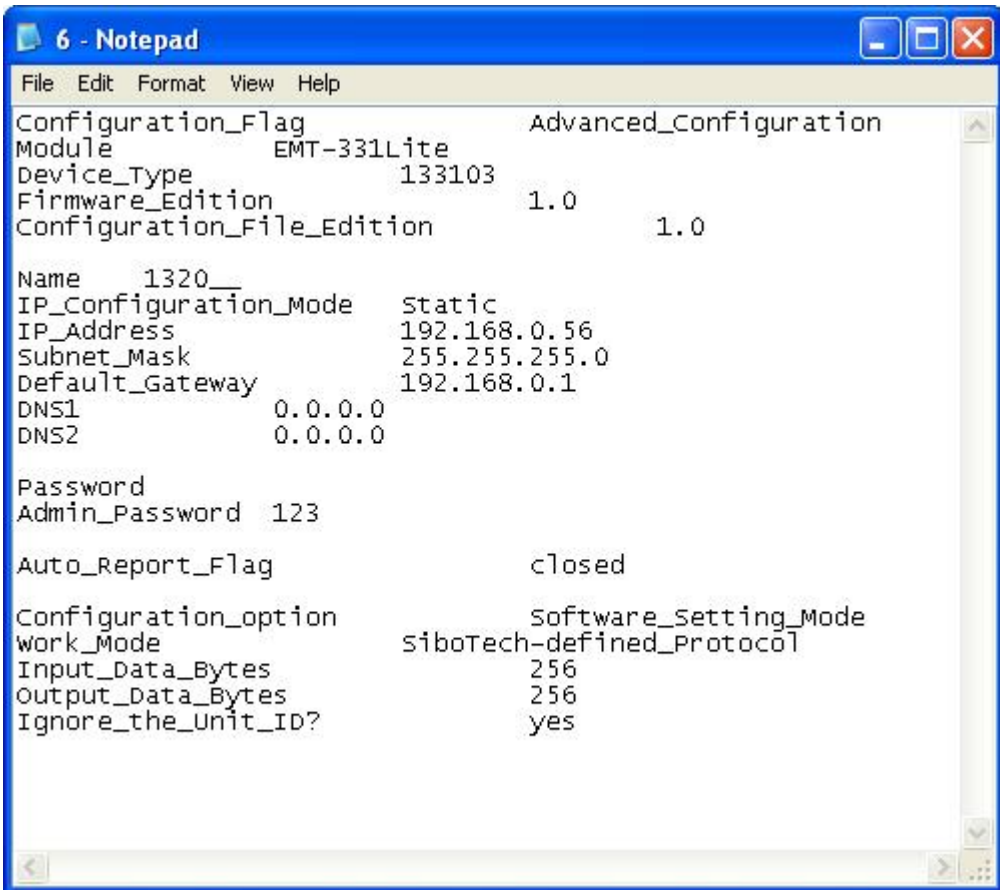
Click “Save” and select a kind of configuration to save the parameters of the equipment as ".inf" format on your local disk.

A password dialog box will pop up if the EMT-331Lite has been set up with a password; you can enter the save window when the password entered is correct:



If the EMT-331Lite has no password setting, you can directly enter the save window:




6 - Notepad
File Edit Format View Help
Configuration_Flag Advanced_Configuration
Module EMT-331Lite
Device_Type 133103
Firmware_Edition 1.0
Configuration_File_Edition 1.0
Name 1320__
IP_Configuration_Mode Static
IP_Address 192.168.0.56
Subnet_Mask 255.255.255.0
Default_Gateway 192.168.0.1
DNS1 0.0.0.0
DNS2 0.0.0.0
Password
Admin_Password 123
Auto_Report_Flag closed
Configuration_option Software_Setting_Mode
Work_Mode SiboTech-defined_Protocol
Input_Data_Bytes 256
Output_Data_Bytes 256
Ignore_the_Unit_ID? yes

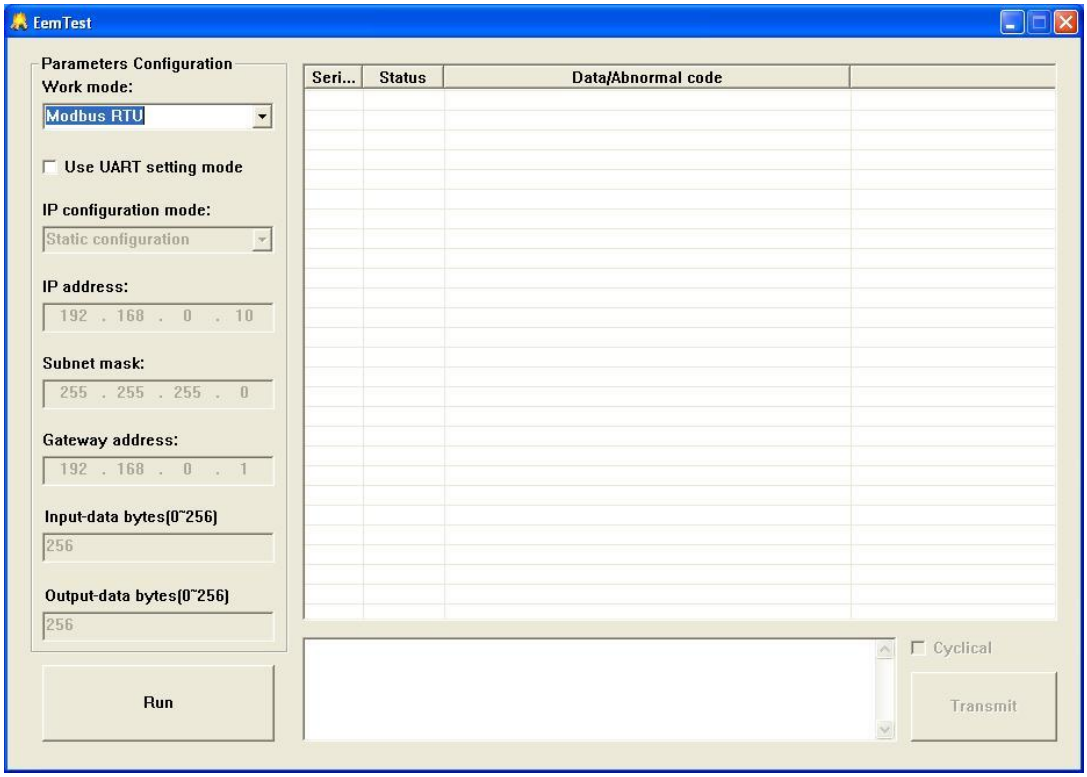
9 Test Software (EemTest)

9.1 Overview

EemTest based on Windows platforms is a software used to test embedded Ethernet module EMT-331Lite and EIP-341. The software function is to test the data transceiver of EIP-341 and EMT-331Lite. The manual introduces the method of testing EMT-331Lite. You can obtain the method of testing EIP-341 in EIP-341 user manual. EemTest can exchange data with EMT-331Lite via Development Board (refer to chapter 6).

You need to use the software with EMT-331Lite development board. We are very sorry that the testing software may have bugs!

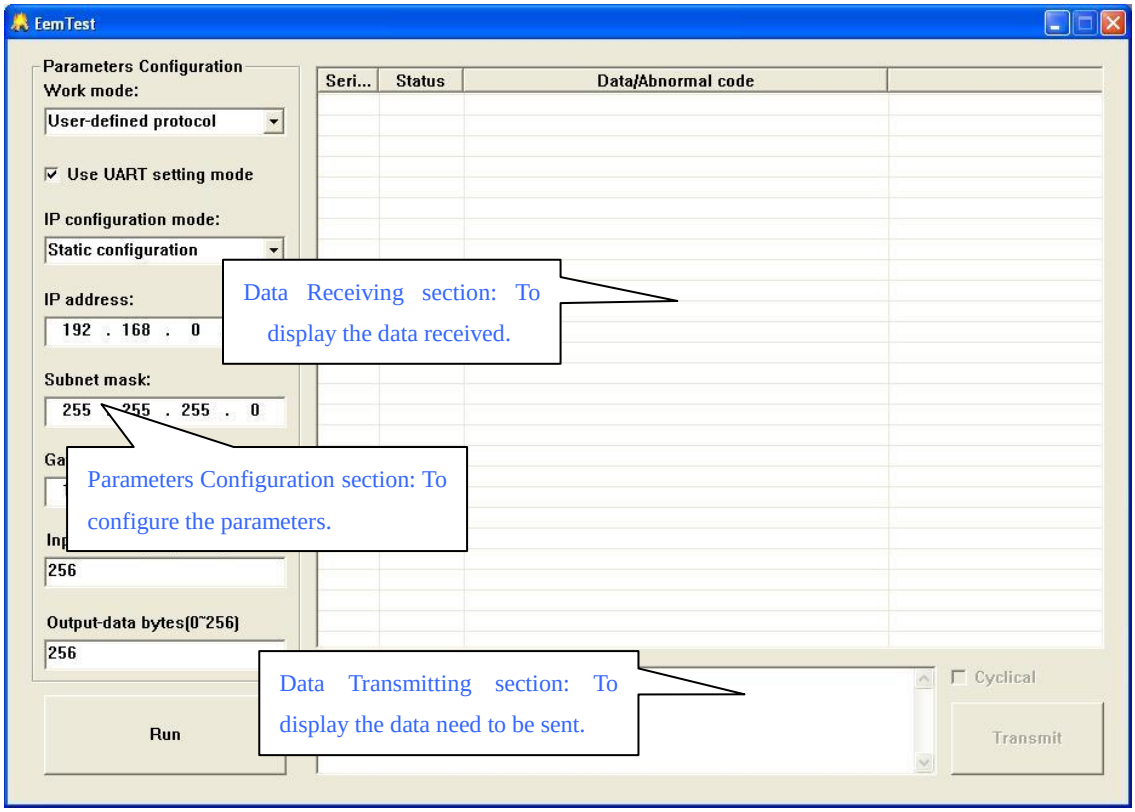
Double click the icon to enter the main Window:



9.2 User Interface

The main interface includes: Parameters Configuration section, Data Receiving section, Data Transmitting section and some functional button.

Note: In the software, all the gray parts cannot be changed.



Work mode: The first combo box in Parameters Configuration session is to set work mode.

Use UART setting mode: when you choose it, “IP configuration mode”, “IP address”, “Subnet mask”, “Gateway address” can be changed. When you choose “UART setting mode” in embedded configuration interface, you must choose the mode here.

IP configuration mode: Static configuration mode, DHCP, and BOOTP can be selected.

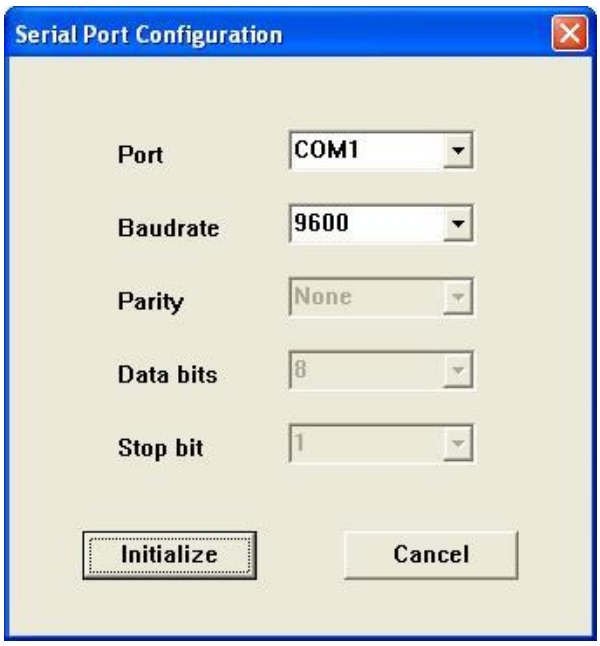
If you don’t choose one, “IP configuration mode”, “IP address”, “Subnet mask”, “Gateway address” cannot be changed, and you can configure IP address and so on through configuration software EMT-123.

Input-data bytes, Output-data bytes: The value must be same with the input and output data bytes of Modbus TCP set in the embedded configuration interface.

9.3 Establish/Disconnect Connection

Data in the Parameters Configuration section has default value, and you can input the value you need and

click “Run”. There will pop up a dialog box to configure serial port:



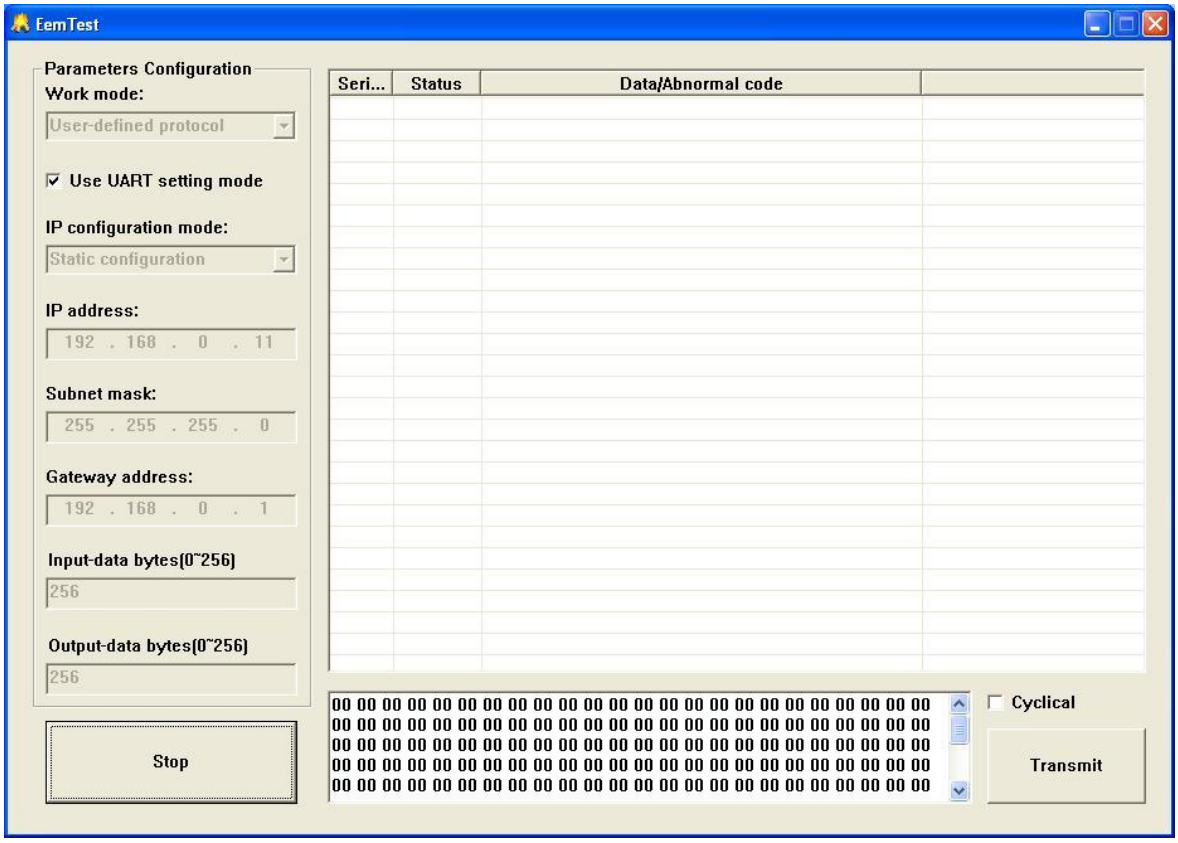
“Port” is the serial port being used; “Baudrate” is current serial port baud rate set by DIP switches.

After configuring parameters, click “Initialize” to establish the connection and initialize hardware configuration.

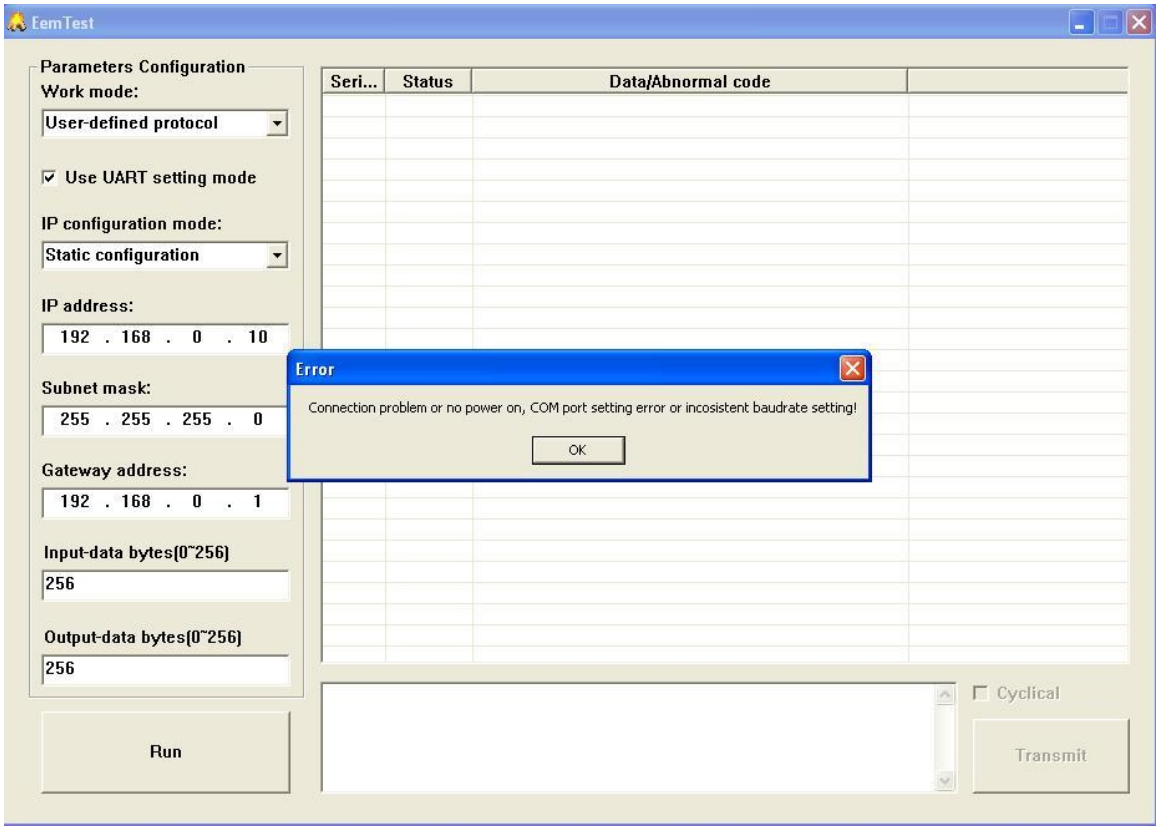
When choosing “Use UART setting mode”, click “Initialize” to send initial messages and enter the running status.

If “Use UART setting mode” is not chosen, click “Initialize” and enter the running status directly.

If the connection is established successfully, all the options in the Parameters Configuration section will be grayed, “Run” button will change to “Stop” and “Transmit” button will change to be usable.



If the connection is failed, there will pop up an alert dialog, and the options in the Parameters Configuration section will not be grayed.

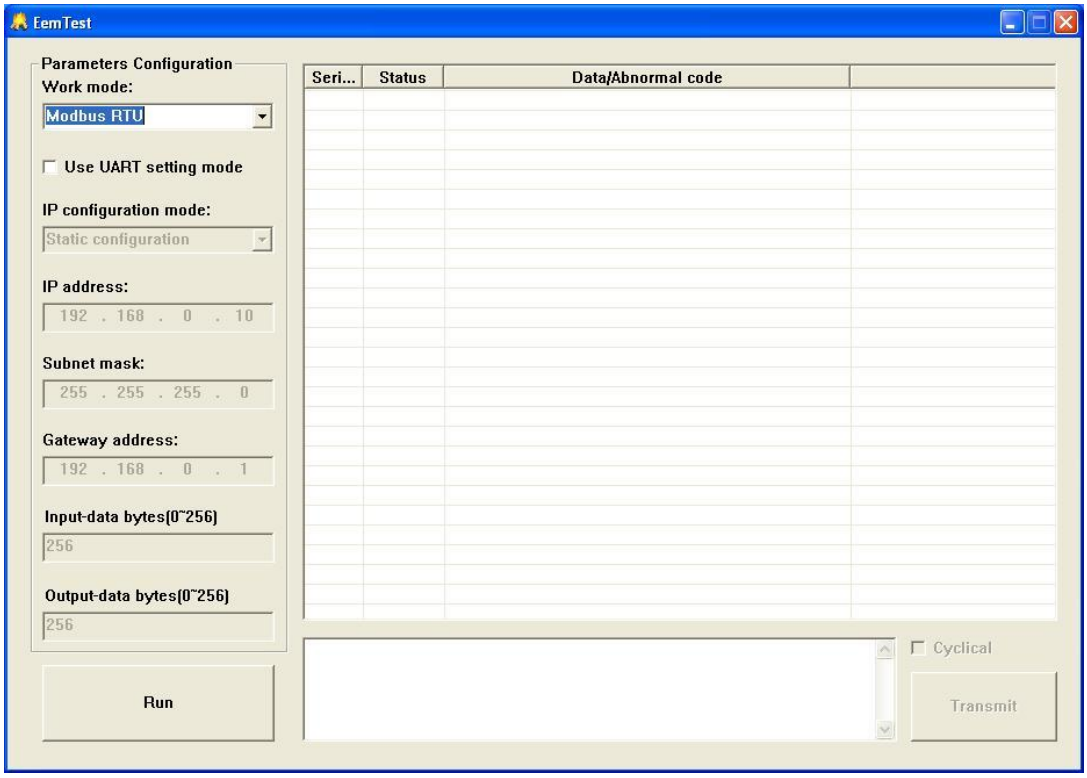


After establishing connection successfully, you can click “Stop” to disconnect the connection. The gray options will be usable after disconnecting, “Stop” button will change to “Run”, and “Transmit” button will change to be unusable.

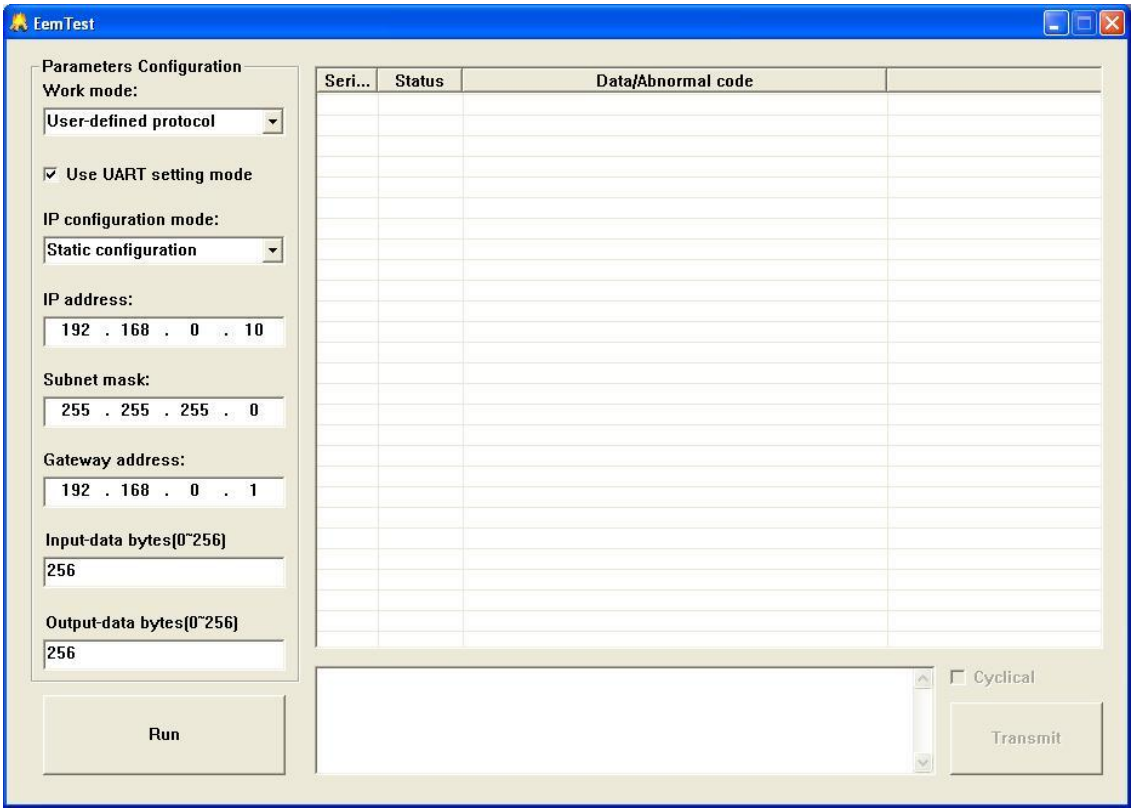
9.4 Set Work Mode

The first combo box in the Parameters Configuration session is to set work mode, and currently it supports two kinds of woke modes: Modbus TCP work mode and SiboTech-defined protocol work mode. The interface and use method are different in different work mode.

Modbus RTU work mode: Test software is Modbus RTU slave, and responses. The interface is as follows:



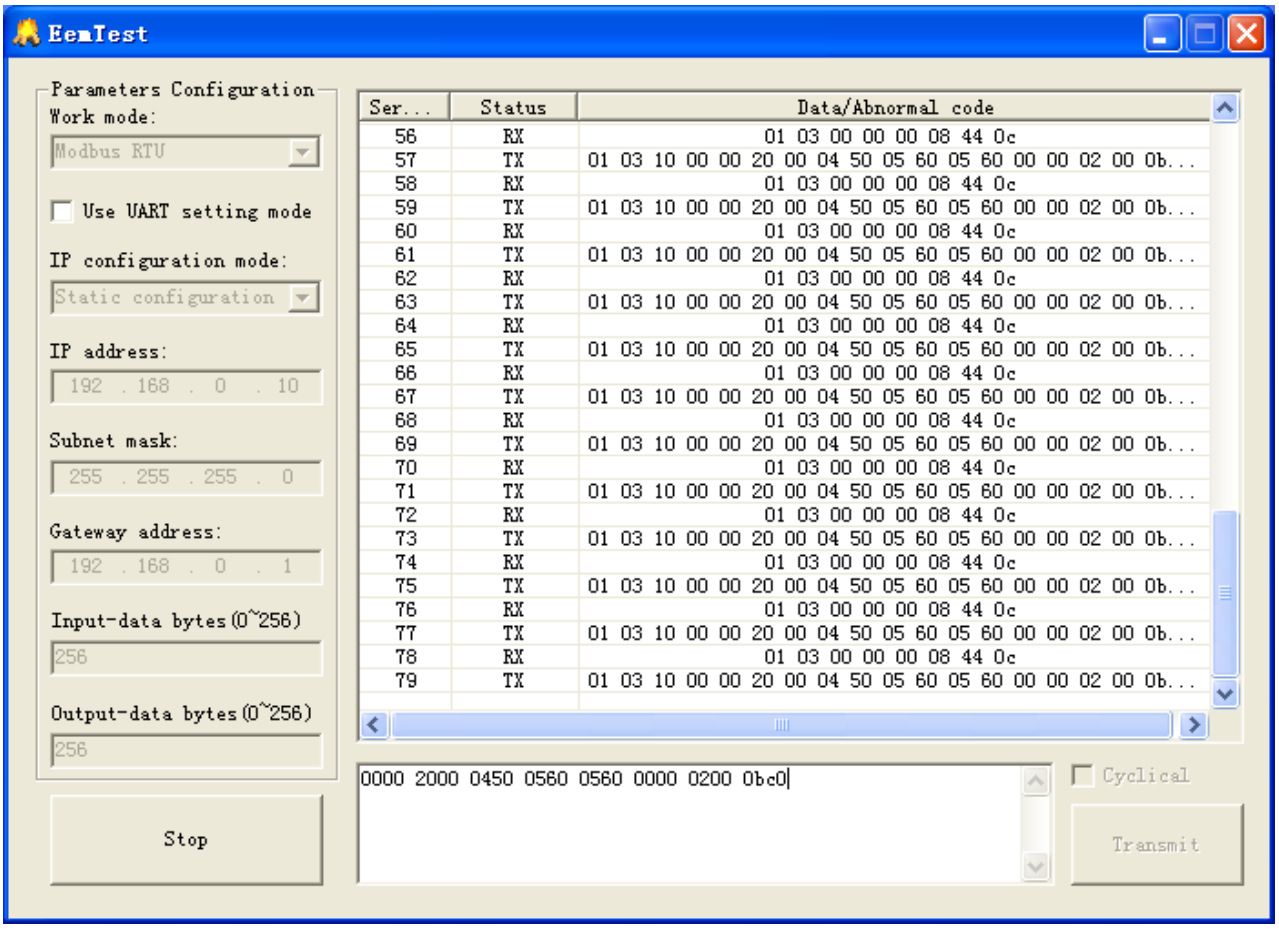
SiboTech-defined protocol work mode: test software is the communication initiator, and the module responses. The interface is as follows:



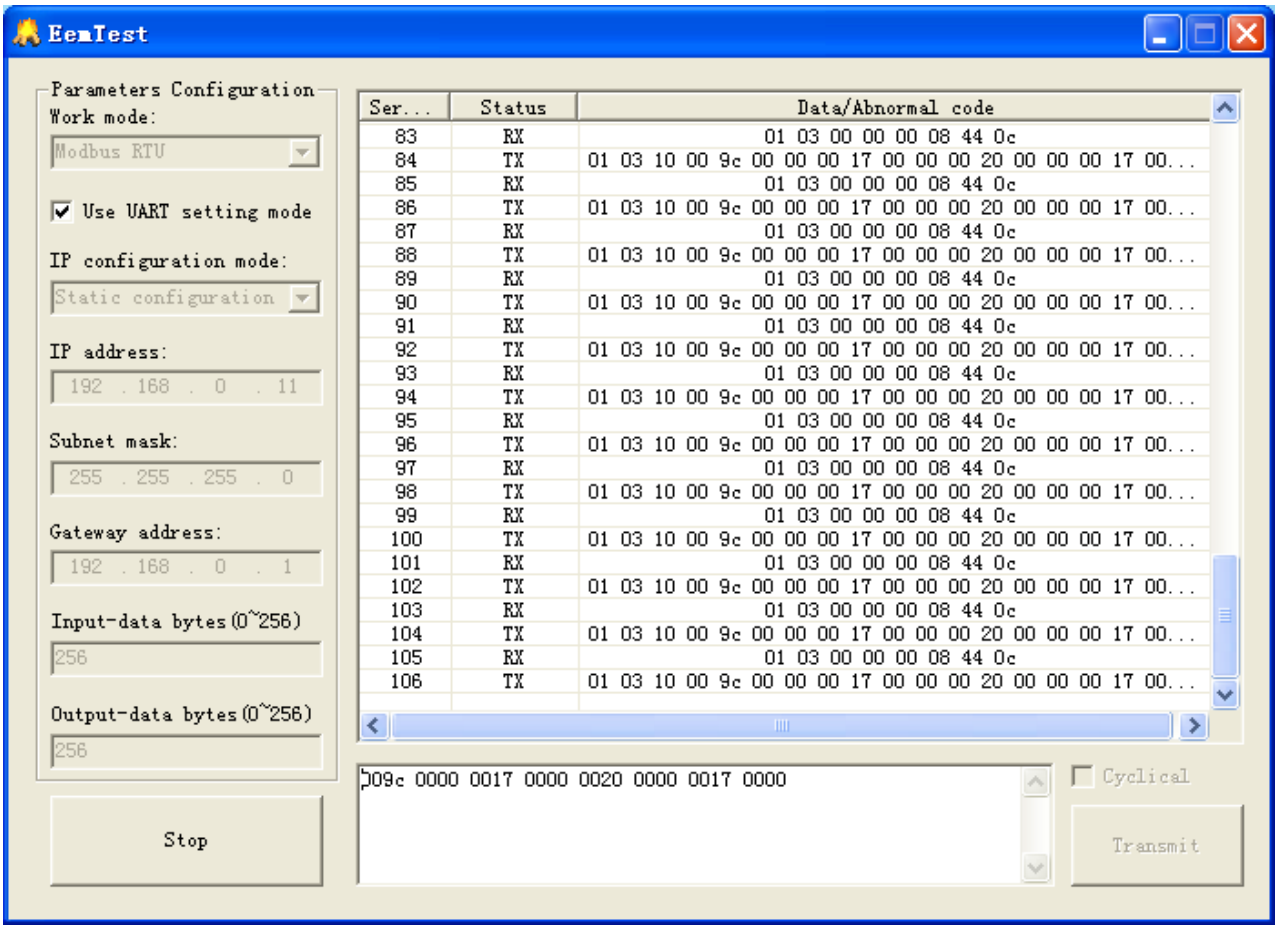
9.5 Receive/Transmit Data

Modbus RTU work mode:

Receive data: After establishing connection successfully, data receiving section will display the receiving data without other operations.



Transmit data: After establishing connection successfully, software receives data, and transmits data according to Modbus protocol and displays them. Testing software currently only supports 03H and 10H function codes (EMT-331Lite supports all the Modbus function codes, and supports the maximum data length allowed by the protocol.), and 8 registers, and the start address of the register is 0(40001), users only need to modify the relevant data in the data transmitting section.



Note: RX is the data received, TX is the data transmitted.

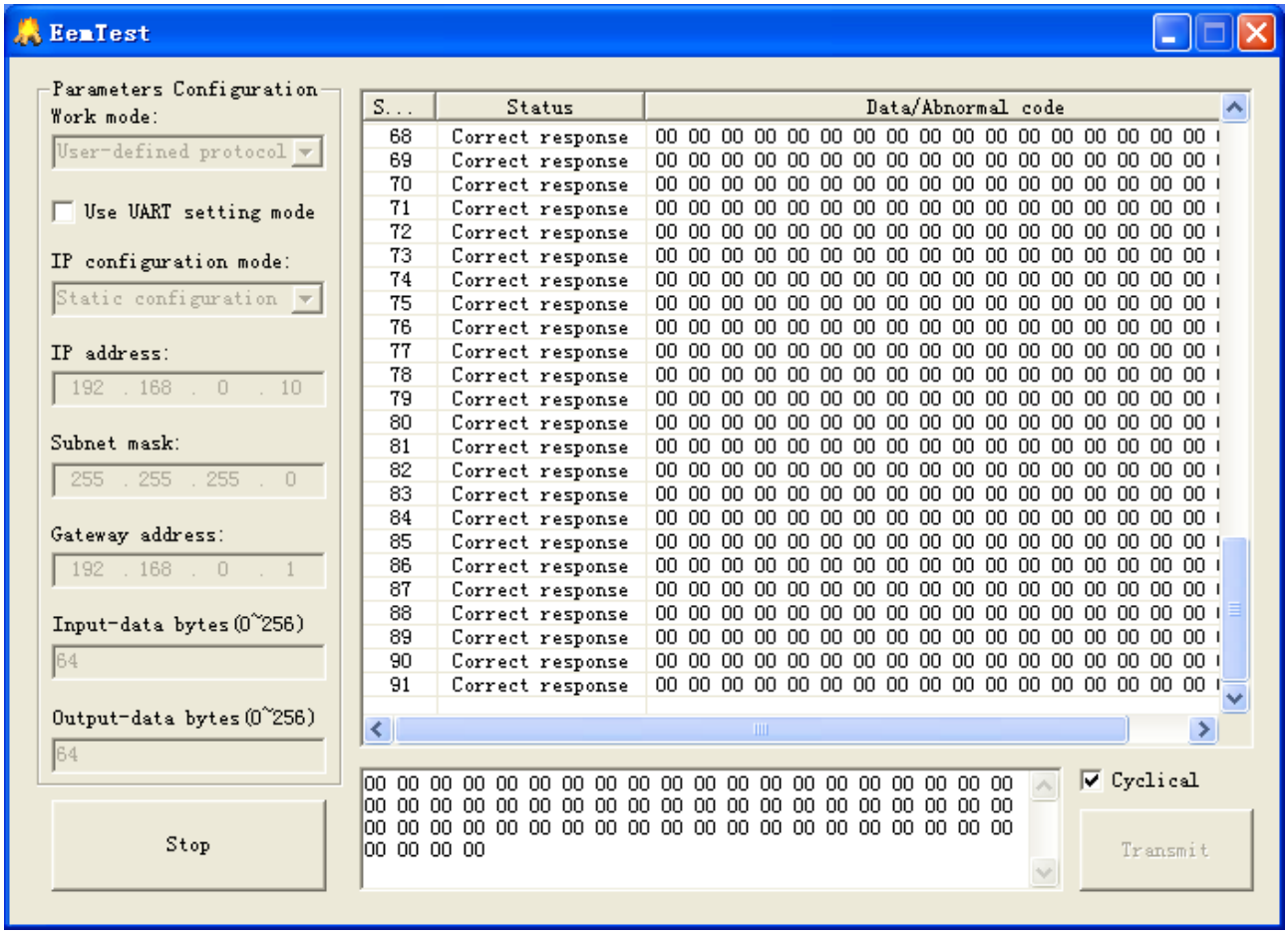
SiboTech-defined protocol work mode:

Data transmitting: After establishing the connection successfully, you can click “Transmit” to transmit data written in the data transmitting section. The format must be correct, and there is a space in each two bytes (HEX), and the data length must be the same with “Input data bytes”.

Data receiving: After establishing the connection successfully, you will receive the data transmitted from the module, and display the data in the data receiving section.

Cyclical: If you want to transmit data cyclically, you need to check “Cyclical”, and click “Transmit” button; if you want to stop transmitting data cyclically, you only need to uncheck “Cyclical”.

Note: The format of the data transmitted must be correct, or you can not transmit them.


EemTest
Parameters Configuration
Work mode:
User-defined protocol
Use UART setting mode
IP configuration mode:
Static configuration
IP address:
192 . 168 . 0 . 10
Subnet mask:
255 . 255 . 255 . 0
Gateway address:
192 . 168 . 0 . 1
Input-data bytes (0~256)
64
Output-data bytes (0~256)
64
Stop
S...
Status
Data/Abnormal code
68 Correct response
69 Correct response
70 Correct response
71 Correct response
72 Correct response
73 Correct response
74 Correct response
75 Correct response
76 Correct response
77 Correct response
78 Correct response
79 Correct response
80 Correct response
81 Correct response
82 Correct response
83 Correct response
84 Correct response
85 Correct response
86 Correct response
87 Correct response
88 Correct response
89 Correct response
90 Correct response
91 Correct response
Cyclical
Transmit